DOCUMENTS EXPEDITING PROJECT

85th Congress
1st Session } COMMITTEE PRINT NO. 2

CONSERVATION AND DEVELOPMENT OF WATER RESOURCES

SUPPLEMENTAL MEMORANDUM

OF THE

CHAIRMEN

TO MEMBERS OF THE

SENATE COMMITTEES ON INTERIOR AND INSULAR AFFAIRS, AND PUBLIC WORKS

IN CONNECTION WITH

S. Res. 281

of the 84th Congress

JANUARY 24, 1957

Printed for the use of the Committee on Interior and Insular Affairs

UNITED STATES
GOVERNMENT PRINTING OFFICE
87417 WASHINGTON : 1957

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LETTER OF TRANSMITTAL

UNITED STATES SENATE,
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS,
January 24, 1957.

To Members of Committees on Interior and Insular Affairs, and Public Works:

Under date of January 4, 1957, we forwarded to you a committee print of comments and recommendations relative to Senate Resolution 281, 84th Congress. Those comments represented views of agencies of the executive branch, State and local governmental agencies, and nongovernmental organizations and individuals.

The appended material, consisting of allocations of construction costs of typical water-resource projects, has been secured from the Department of the Army and the Department of the Interior. It is a part of the study that is called for by Senate Resolution 281.

JAMES E. MURRAY,
Chairman, Committee on Interior and Insular Affairs.

DENNIS CHAVEZ,
Chairman, Committee on Public Works.

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DEPARTMENT OF THE ARMY

DEPARTMENT OF THE ARMY,
OFFICE OF THE SECRETARY OF THE ARMY,
Washington, D. C., November 2, 1956.

Hon. JAMES E. MURRAY,
United States Senate.

DEAR SENATOR MURRAY: In your letter of July 31, 1956, you requested, in behalf of the chairmen of the Senate Committees on Interior and Insular Affairs and on Public Works and the chairmen of the Subcommittees on Irrigation and Reclamation and on Flood Control, objective information and suggestions by November 1, 1956, for the information and guidance of the committees in discharging their responsibilities under Senate Resolution No. 281, 84th Congress. In subsequent letters dated August 8, 1956, and August 16, 1956, you requested specific information on cost allocations and on benefit-cost practices.

These requests have received careful attention within the Department of the Army. As you know, representatives of the Department have participated in or contributed to several intensive studies during recent years on the subject of policies and procedures applicable to conservation, development, and use of water and related land resources. These include the May 1950 report of the Federal Interagency Committee's Subcommittee on Benefits and Costs, the December 1950 report of the President's Water Resources Policy Commission, the June 1955 Report on Water Resources and Power by the Commission on Organization of the Executive Branch of the Government and, most recently, the December 1955 report of the Presidential Advisory Committee on Water Resources Policy. The results of the Department's objective consideration of all of the problems involved, including the interrelation of the activities of all agencies concerned, both Federal and non-Federal, are reflected in the foregoing reports, particularly in the report of the Presidential Advisory Committee on Water Resources Policy.

The cost allocation data requested in your letter of August 8, 1956, are transmitted herewith, and I hope that these data will prove satisfactory and useful to your committees. Data on benefit-cost practices, in response to your letter of August 16, 1956, will be furnished by November 15, 1956, as requested.

Upon request, I shall be pleased to furnish any additional information available in the Department.

Sincerely yours,

WILBER M. BRUCKER,
Secretary of the Army.

COST ALLOCATION DATA ON PROJECTS OF THE CORPS OF ENGINEERS

For the Arkansas, White, Red Basins, data are furnished herewith for the Table Rock, Norfork, Bull Shoals, Tenkiller Ferry, Fort Gibson, Denison, Whitney, Blakely Mountain, and Narrows projects. Except for the last two projects these data are on the basis of 1954 price levels to facilitate comparison with the information considered in the Senate Public Works Committee hearings on power rates early in 1956. Data on a current price level basis have been used for the Blakely Mountain and Narrows projects.

In the Columbia Basin, data are furnished for the McNary, Bonneville, and the Dalles projects. The McNary and the Dalles project data are on a current-price-level basis. The Bonneville data are based on information available for the allocation of cost made by the Federal Power Commission in 1945. No data are furnished for the Chief Joseph project as the entire cost of this project is considered chargeable to power. The only facility provided at Chief Joseph for purposes other than power is a penstock for possible future irrigation use.

For the Missouri River Basin, data are furnished for the Fort Peck, Garrison, Oahe, and Fort Randall Dams as requested in the letter of August 8 and also for the Gavins Point and Big Bend projects which are integral parts of the Missouri main-stem development. All Missouri Basin project data are on a 1954-price-level basis.

The data furnished herewith for the Russian River Reservoir (Coyote Valley) are on a current-price-level basis.

No data are furnished on the Folsom project listed in the letter of August 8 as this project is being turned over to the Bureau of Reclamation for operation, and it is understood that the Department of the Interior will furnish the cost-allocation data on the Folsom project as part of their data on the Central Valley project.

Missouri River Main Stem System

Study No. 1.—*Summary of results of applying various methods of cost allocation, Missouri River main stem system*

[Figures in thousands of dollars]

	System					Fort Peck					Garrison				
	Flood control	Power	Navigation	Irrigation	Total	Flood control	Power	Navigation	Irrigation	Total	Flood control	Power	Navigation	Irrigation	Total
1. Separable costs-remaining benefits:															
(a) Allocation of joint reservoir costs	$142,000	$289,500	$95,200	$166,300	$693,000	$21,900	$44,500	$15,600	$35,300	$117,300	$37,400	$76,600	$26,800	$60,700	$201,500
(b) Add specific reservoir costs	15,200	418,200			433,400	700	39,800			40,500	6,000	86,300			92,300
(c) Recreation					3,200					500					1,200
(1) Subtotal reservoir allocation	157,200	707,700	95,200	166,300	1,129,600	22,600	84,300	15,600	35,300	158,300	43,400	162,900	26,800	60,700	295,000
(d) Interest during construction for power		42,800					3,600					9,900			
(e) Total power investment		750,500					87,900					172,800			
2. Alternative justifiable expenditure:															
(a) Allocation of joint reservoir costs	150,800	304,300	95,400	142,500	693,000	23,500	47,600	15,900	30,300	117,300	40,500	81,700	27,300	52,000	201,500
(b) Add specific reservoir costs	15,200	418,200			433,400	700	39,800			40,500	6,000	86,300			92,300
(c) Recreation					3,200					500					1,200
(1) Subtotal reservoir allocation	166,000	722,500	95,400	142,500	1,129,600	24,200	87,400	15,900	30,300	158,300	46,500	168,000	27,300	52,000	295,000
(d) Interest during construction for power		43,200					3,700					10,000			
(e) Total power investment		765,700					91,100					178,000			

MISSOURI RIVER MAIN STEM SYSTEM—Continued

STUDY NO. 1.—*Summary of results of applying various methods of cost allocation. Missouri River main stem system*—Continued

[Figures in thousands of dollars]

	System					Fort Peck					Garrison				
	Flood control	Power	Navigation	Irrigation	Total	Flood control	Power	Navigation	Irrigation	Total	Flood control	Power	Navigation	Irrigation	Total
3. Priority of use:															
(a) Allocation of joint reservoir costs	$266,800	$158,660	$53,200	$214,340	$693,000	$39,700	$23,560	$8,500	$45,540	$117,300	$68,100	$40,600	$14,500	$78,300	$201,500
(b) Allocation of specific reservoir costs	15,200	418,200			433,400	700	39,800			40,500	6,000	86,300			92,300
(c) Recreation					3,200					500					1,200
(1) Subtotal reservoir allocation	282,000	576,860	53,200	214,340	1,129,600	40,400	63,360	8,500	45,540	158,300	74,100	126,900	14,500	78,300	295,00
(d) Interest during construction for power		34,240					2,820					7,740			
(e) Total power investment		611,100					66,180					134,640			
4. Use of facilities:															
(a) Allocation of joint reservoir costs	118,000	259,800	125,500	189,700	693,000	17,700	39,000	20,300	40,300	117,300	30,300	67,000	34,900	69,300	201,500
(b) Allocation of specific reservoir costs	15,200	418,200			433,400	700	39,800			40,500	6,000	86,300			92,300
(c) Recreation					3,200					500					1,200
(1) Subtotal reservoir allocation	133,200	678,000	125,500	189,700	1,129,600	18,400	78,800	20,300	40,300	158,300	36,300	153,300	34,900	69,300	295,000
(d) Interest during construction for power		40,200					3,400					9,200			
(e) Total power investment		718,200					82,200					162,500			
5. Average of 4 above methods:															
(a) Allocation of joint reservoir costs	169,400	253,065	92,325	178,210	693,000	25,700	38,665	15,075	37,860	117,300	44,075	66,475	25,875	65,075	201,500

(b) Allocation of specific reservoir costs	15,200	418,200			433,400	700	39,800			40,500	6,000	86,300				92,300
(c) Recreation					3,200					500						1,200
(1) Subtotal reservoir allocation	184,600	671,265	92,325	178,210	1,129,600	26,400	78,465	15,075	37,860	158,300	50,075	152,775	25,875	65,075		295,000
(d) Interest during construction for power		40,110					3,380					9,210				
(e) Total power investment		711,375					81,845					161,985				

	Oahe					Fort Randall				Gavins Point			Big Bend, power
	Flood control	Power	Navigation	Irrigation	Total	Flood control	Power	Navigation	Total	Flood control	Power	Total	
1. Separable costs-remaining benefits:													
(a) Allocation of joint reservoir costs	$43,400	$88,400	$31,000	$70,300	$233,100	$30,400	$61,800	$21,800	$114,000	$8,900	$18,200	$27,100	
(b) Add specific reservoir costs	5,300	118,000			123,300	3,200	77,300		80,500		25,300	25,300	$71,500
(c) Recreation					400				500			600	
(1) Subtotal reservoir allocation	48,700	206,400	31,000	70,300	356,800	33,600	139,100	21,800	195,000	8,900	43,500	53,000	71,500
(d) Interest during construction for power		14,100					10,200				1,400		3,600
(e) Total power investment		220,500					149,300				44,900		75,100
2. Alternative justifiable expenditure:													
(a) Allocation of joint reservoir costs	46,900	94,500	31,500	60,200	233,100	30,900	62,400	20,700	114,000	9,000	18,100	27,100	
(b) Add specific reservoir costs	5,300	118,000			123,300	3,200	77,300		80,500		25,300	25,300	71,500
(c) Recreation					400				500			600	
(1) Subtotal reservoir allocation	52,200	212,500	31,500	60,200	356,800	34,100	139,700	20,700	195,000	9,000	43,400	53,000	71,500
(d) Interest during construction for power		14,300					10,200				1,400		3,600
(e) Total power investment		226,800					149,900				44,800		75,100
3. Priority of use:													
(a) Allocation of joint reservoir costs	78,900	46,900	16,800	90,500	233,100	63,100	37,500	13,400	114,000	17,000	10,100	27,100	
(b) Allocation of specific reservoir costs	5,300	118,000			123,300	3,200	77,300		80,500		25,300	25,300	71,500
(c) Recreation					400				500			600	
(1) Subtotal reservoir allocation	84,200	164,900	16,800	90,500	356,800	66,300	114,800	13,400	195,000	17,000	35,400	53,000	71,500
(d) Interest during construction for power		11,020					7,970				1,090		3,600
(e) Total power investment		175,920					122,770				36,490		75,100

Missouri River Main Stem System—Continued

Study No. 1.—*Summary of results of applying various methods of cost allocation. Missouri River main-stem system*—Continued

[Figures in thousands of dollars]

	Oahe					Fort Randall				Gavins Point			Big Bend, power
	Flood control	Power	Navigation	Irrigation	Total	Flood control	Power	Navigation	Total	Flood control	Power	Total	
4. Use of facilities:													
(a) Allocation of joint reservoir costs	$35,200	$77,500	$40,300	$80,100	$233,100	$26,300	$57,700	$30,000	$114,000	$8,500	$18,600	$27,100	
(b) Allocation of specific reservoir costs	5,300	118,000			123,300	3,200	77,300		80,500		25,300	25,300	$71,500
(c) Recreation					400				500			600	
(1) Subtotal reservoir allocation	40,500	195,500	40,300	80,100	356,800	29,500	135,000	30,000	195,000	8,500	43,900	53,000	71,500
(d) Interest during construction for power		13,200					9,500				1,300		3,600
(e) Total power investment		208,700					144,500				45,200		75,100
5. Average of 4 above methods:													
(a) Allocation of joint reservoir costs	51,100	76,825	29,900	75,275	233,100	37,675	54,850	21,475	114,000	10,850	16,250	27,100	
(b) Allocation of specific reservoir costs	5,300	118,000			123,300	3,200	77,300		80,500		25,300	25,300	71,500
(c) Recreation					400				500			600	
(1) Subtotal reservoir allocation	56,400	194,825	29,900	75,275	356,800	40,875	132,150	21,475	195,000	10,850	41,550	53,000	71,500
(d) Interest during construction for power		13,155					9,468				1,297		3,600
(e) Total power investment		207,980					141,618				42,847		75,100

STUDY NO. 1–A.—*Separable costs-remaining benefits allocation. Missouri River main stem system*

[Figures in thousands of dollars]

	System					Fort Peck					Garrison				
	Flood control	Power	Navigation	Irrigation	Total	Flood control	Power	Navigation	Irrigation	Total	Flood control	Power	Navigation	Irrigation	Total
1. Annual benefit	(1)	[2] $53,989	$7,701	[3] $11,700											
2. Single-purpose alternative	($289,940)		(172,900)	(175,000)											
(a) Construction cost	10,220		6,100	6,170											
(b) Interest during construction	249		160	190											
(c) Operation, maintenance, and replacement	1,195		690	3,980											
(1) Total	11,664		6,950	10,340											
3. Justifiable investment	11,664	53,989	6,950	10,340											
4. Separable costs, dam and reservoir [4]	(89,820)	(576,860)	(53,200)	(117,449)	($837,329)										
(a) Construction cost	3,167	20,339	1,876	4,141											
(b) Interest during construction	177	1,207	99	235											
(c) Operation, maintenance, and replacement	553	3,667	132	417											
(1) Total	3,897	25,213	2,107	4,793											
5. Separable costs, distribution system		13,682													
6. Taxes foregone		38,895			49,692										
7. Total annual assigned costs	3,897	15,094	2,107	4,793	33,251										
8. Remaining benefits	7,767		4,843	5,547											
9. Percent distribution	23.36	45.40	14.56	16.68	100										
10. Remaining costs to be allocated					(289,071)										
(a) Construction	2,376	4,613	1,481	722	10,192										
(b) Interest during construction	150	302	95	111	658										
(c) Operation, maintenance and replacement	195	378	121	139	833										
(1) Total	2,721	5,293	1,697	1,972	11,683										

See footnotes at end of table, p. 9.

Missouri River Main Stem System—Continued

Study No. 1-A.—*Separable costs-remaining benefits allocation, Missouri River main stem system*—Continued

[Figures in thousands of dollars]

	System					Fort Peck					Garrison				
	Flood control	Power	Navigation	Irrigation	Total	Flood control	Power	Navigation	Irrigation	Total	Flood control	Power	Navigation	Irrigation	Total
11. Total annual costs (line 7 plus 10 (1))	$6,618	$44,188	$3,804	$6,765	$61,375										
Benefit-cost ratio		1.22	2.02	1.73											
3. Capitalization, dam and reservoir costs															
(a) Separable costs [4 5]	89,820	576,860	53,200	117,449	837,329	$700	$39,800			$40,500	$6,000	$86,300			$92,300
(b) Joint construction costs	67,380	130,840	42,000	48,851	289,071	21,900	44,500	$15,600	$35,300	117,300	37,400	76,600	$26,800	$60,700	201,500
Recreation					3,200					500					1,200
Total construction costs	157,200	707,700	95,200	166,300	1,129,600	22,600	84,300	15,600	35,300	158,300	43,400	162,900	26,800	60,700	295,000
13. Recapitulation of reimbursable power costs															
(a) Dam and reservoir		707,700					84,300					162,900			
(1) Interest during construction		42,800					3,600					9,900			
(b) Total power investment		750,500					87,900					172,800			

	Oahe					Fort Randall				Gavins Point			Big Bend, power
	Flood control	Power	Navigation	Irrigation	Total	Flood control	Power	Navigation	Total	Flood control	Power	Total	
1. Annual benefit													
2. Single-purpose alternative													
(a) Construction cost													
(b) Interest during construction													

(c) Operation, maintenance, and replacement													
(1) Total													
3. Justifiable investment													
4. Separable costs, dam and reservoir [4]													
(a) Construction cost													
(b) Interest during construction													
(c) Operation, maintenance, and replacement													
(1) Total													
5. Separable costs, distribution system													
6. Taxes foregone													
7. Total annual assigned costs													
8. Remaining benefits													
9. Percent distribution													
10. Remaining costs to be allocated													
(a) Construction													
(b) Interest during construction													
(c) Operation, maintenance and replacement													
(1) Total													
11. Total annual costs (line 7 plus 10 (1))													
Benefit-cost ratio													
12. Capitalization, dam and reservoir costs													
(a) Separable costs [4] [6]	$5,030	$118,000			$123,300	$3,200	$77,300		$80,500		$25,300	$25,300	$71,500
(b) Joint construction costs	43,400	88,400	$31,000	$70,300	233,100	30,400	61,800	$21,800	114,000	$8,900	18,200	27,100	
Recreation					400				500			600	
Total construction costs	48,700	206,400	31,000	70,300	356,800	33,600	139,100	21,800	195,000	8,900	43,500	53,000	71,500
13. Recapitulation of reimbursable power costs													
(a) Dam and reservoir		206,400					139,100				43,500		71,500
(1) Interest during construction		14,100					10,200				1,400		3,600
(b) Total power investment		220,500					149,300				44,900		75,100

[1] Tentative flood control benefit estimates exceed single-purpose alternative costs.
[2] Includes taxes foregone.
[3] Based on data furnished by Bureau of Reclamation.
[4] Includes reservoir costs of specific features:

	Flood control	Power	Navigation	Irrigation
Separable minus specific costs	$74,678	$158,536	$52,300	$117,449
Specific costs	15,142	418,324		

[5] Specific costs for individual projects, although separable costs are shown for the system.

MISSOURI RIVER MAIN-STEM SYSTEM—Continued

STUDY NO. 1-B.—*Alternative-justifiable expenditure method, Missouri River main stem system*

[Figures in thousands of dollars]

	ystem					Fort Peck					Garrison				
	Flood control	Power	Naviga-tion	Irriga-tion	Total	Flood control	Power	Naviga-tion	Irriga-tion	Total	Flood control	Power	Naviga-tion	Irriga-tion	Total
1. Annual benefit	(1)	[2] $53,989	$7,701	[3] $11,700											
2. Single-purpose alternative	($289,940)		(172,900)	(175,000)											
(a) Construction cost	10,220		6,100	6,170											
(b) Interest during construction	249		160	190											
(c) Operation, maintenance and replacement	1,195		690	3,980											
(1) Total	11,664		6,950	10,340											
3. Justifiable investment	11,664	53,989	6,950	10,340	$82,943										
4. Less specific costs	(15,200)	(418,200)													
(a) Construction cost	536	14,743													
(b) Interest during construction	34	871													
(c) Operation, maintenance and replacement	101	2,666													
(d) Taxes foregone		13,682													
(1) Total	671	31,962			32,633										
5. Remaining alternative	10,993	22,027	6,950	10,340	50,310										
6. Percent distribution	21.8	43.8	13.8	20.6	100										
7. Total joint costs to be allocated:															
(a) Construction cost	5,291	10,630	349	4,999	24,369										
(b) Interest during construction	318	640	202	301	1,461										
(c) Operation, maintenance and replacement	618	1,242	391	584	2,835										
(1) Total	6,227	12,512	3,942	5,884	28,565										

8. Total annual costs (line 4 (1) plus 7 (1))	6,898	44,474	3,942	5,884	61,198										
Benefit-cost ratio	1.47	1.20	1.87	1.91	1.58										
9. Reservoir construction cost allocation:															
(a) Joint reservoir costs	150,800	304,300	95,400	142,500	693,000	$23,500	$47,600	$15,900	$30,300	$117,300	$40,500	$81,700	$27,300	$52,000	$201,500
(b) Specific reservoir costs	15,200	418,200			433,400	700	39,800			40,500	6,000	86,300			92,300
(1) Subtotal	166,000	722,500	95,400	142,500	1,126,400	24,200	87,400	15,900	30,300	157,800	46,500	168,000	27,300	52,000	293,800
(c) Recreation					3,200					500					1,200
(1) Total	166,000	722,500	95,400	142,500	1,129,600	24,200	87,400	15,900	30,300	158,300	46,500	168,000	27,300	52,000	295,000
10. Recapitulation of reimbursable power costs:															
(a) Dams and reservoirs		722,500					87,400					168,000			
(b) Interest during construction		43,200					3,700					10,000			
(1) Total power investment		765,700					91,100					178,000			

	Oahe					Fort Randall				Gavins Point			Big Bend, power
	Flood control	Power	Navigation	Irrigation	Total	Flood control	Power	Navigation	Total	Flood control	Power	Total	
1. Annual benefit													
2. Single-purpose alternative													
(a) Construction cost													
(b) Interest during construction													
(c) Operation, maintenance and replacement													
(1) Total													
3. Justifiable investment													
4. Less specific costs													
(a) Construction cost													
(b) Interest during construction													
(c) Operation, maintenance and replacement													
(d) Taxes foregone													
(1) Total													
5. Remaining alternative													

See footnotes at end of table, p. 12.

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MISSOURI RIVER MAIN STEM SYSTEM—Continued

STUDY NO. 1–B.—*Alternative-justifiable expenditure method, Missouri River main stem system*—Continued

[Figures in thousands of dollars]

	Oahe					Fort Randall				Gavins Point			Big Bend, power
	Flood control	Power	Navigation	Irrigation	Total	Flood control	Power	Navigation	Total	Flood control	Power	Total	
6. Percent distribution													
7. Total joint costs to be allocated:													
(a) Construction cost													
(b) Interest during construction													
(c) Operation, maintenance, and replacement													
(1) Total													
8. Total annual costs (line 4 (1) plus 7 (1))													
Benefit-cost ratio													
9. Reservoir construction cost allocation:													
(a) Joint reservoir costs	$46,900	$94,500	$31,500	$60,200	$233,100	$30,900	$62,400	$20,700	$114,000	$9,000	$18,100	$27,100	
(b) Specific reservoir costs	5,300	118,000			123,300	3,200	77,300		80,500		25,300	25,300	$71,500
(1) Subtotal	52,200	212,500	31,500	60,200	356,400	34,100	139,700	20,700	194,500	9,000	43,400	52,400	71,500
(c) Recreation					400				500			600	
(1) Total	52,200	212,500	31,500	60,200	356,800	34,100	139,700	20,700	195,000	9,000	43,400	53,000	71,500
10. Recapitulation of reimbursable power costs:													
(a) Dams and reservoirs		212,500					139,700				43,400		71,500
(b) Interest during construction		14,300					10,200				1,400		3,600
(1) Total power investment		226,800					149,900				44,800		75,100

[1] Tentative flood control benefit estimates exceed single-purpose alternative costs.
[2] Includes taxes foregone.
[3] Based on data furnished by Bureau of Reclamation.

STUDY No. 1–C.—*Priority of use method, Missouri River main-stem system*

[Figures in thousands of dollars]

	System				Fort Peck					Garrison					
	Flood control	Power	Navigation	Irrigation	Total	Flood control	Power	Navigation	Irrigation	Total	Flood control	Power	Navigation	Irrigation	Total
1. Annual benefit	(1)	[3] $53,989	$7,701	[3] $11,700											
2. Single-purpose alternative	($289,940)		(172,900)	(175,000)											
(a) Construction cost	10,220		6,100	6,170											
(b) Interest during construction	249		160	190											
(c) Operation, maintenance and replacement	1,195		690	3,980											
(1) Total	11,664	53,989	6,950	10,340											
3. Justifiable investment	11,664	53,989	6,950	10,340											
4. Separable costs	(89,820)	(576,860)	(53,200)	(117,449)	($837,329)										
(a) Construction cost	3,167	20,339	1,876	4,141											
(b) Interest during construction	177	1,207	99	235											
(c) Operation, maintenance and replacement	553	3,663	132	417											
(1) Total	3,897	25,213	2,107	4,793											
5. Taxes foregone		13,682													
6. Total annual assigned costs	3,897	38,895	2,107	4,793	49,692										
7. Remaining justifiable investment	7,767	15,094	4,843	5,547											
8. Remaining costs					(289,071)										
(a) Construction cost	6,776			3,416	10,192										
(b) Interest during construction	437			221	658										
(c) Operation, maintenance and replacement	554			279	833										
(1) Total	7,767			3,916	11,683										
9. Total annual costs	11,664	38,895	2,107	8,709	61,375										

See footnotes at end of table, p. 15.

MISSOURI RIVER MAIN STEM SYSTEM—Continued

STUDY No. 1-C.—*Priority of use method, Missouri River main-stem system*—Continued

[Figures in thousands of dollars]

	System					Fort Peck					Garrison				
	Flood control	Power	Naviga tion	Irrigation	Total	Flood control	Power	Naviga-tion	Irriga-tion	Total	Flood control	Power	Naviga-tion	Irriga-tion	Total
10. Capitalization, dam and reservoir costs:															
(a) Separable costs [4]	89, 820	576, 860	53, 200	117, 449	837, 329	$700	$39, 800			$40, 500	$6, 000	$86, 300			$92, 300
(b) Joint costs	192, 180			96, 891	289, 071	39, 700	23, 560	$8, 500	$45, 540	117, 300	68, 100	40, 600	$14, 500	$78, 300	201, 500
Recreation					3, 200					500					1, 200
Total construction costs	282, 000	576, 860	53, 200	214, 340	1, 129, 600	40, 400	63, 360	8, 500	45, 540	158, 300	74, 100	126, 900	14, 500	78, 300	295, 000
11. Recapitulation of reimbursable power costs:															
(a) Dam and reservoir		576, 860					63, 360					126, 900			
(1) Interest during construction		34, 240					2, 820					7, 740			
(b) Total power investment		611, 100					66, 180					134, 640			

	Oahe					Fort Randall				Gavins Point			Bigf Bend, power
	Flood control	Power	Naviga-tion	Irriga-tion	Total	Flood control	Power	Naviga-tion	Total	Flood control	Power	Total	
1. Annual benefit													
2. Single purpose alternative													
(a) Construction cost													
(b) Interest during construction													
(c) Operation, maintenance and replacement													
(1) Total													
3. Justifiable investment													

4. Separable costs													
(a) Construction cost													
(b) Interest during construction													
(c) Operation, maintenance and replacement													
(1) Total													
5. Taxes foregone													
6. Total annual assigned costs													
7. Remaining justifiable investment													
8. Remaining costs													
(a) Construction cost													
(b) Interest during construction													
(c) Operation, maintenance and replacement													
(1) Total													
9. Total annual costs													
10. Capitalization, dam and reservoir costs:													
(a) Separable costs [4]	$5,300	$118,000			$123,300	$3,200	$77,300		$80,500		$25,300	$25,300	$71,500
(b) Joint costs	78,900	46,900	$16,800	$90,500	233,100	63,100	37,500	$13,400	114,000	$17,000	10,100	27,100	
Recreation					40				500			600	
Total construction costs	84,200	164,900	16,800	90,500	356,800	66,300	114,800	13,400	195,000	17,000	35,400	53,000	71,500
11. Recapitulation of remibursable power costs:													
(a) Dam and reservoir		164,900					114,800				35,400		71,500
(1) Interest during construction		11,020					7,970				1,090		3,600
(b) Total power investment		175,920					122,770				36,490		75,100

[1] Tentative flood control estimates exceed single-purpose alternative costs.
[2] Includes taxes foregone.
[3] Based on data furnished by Bureau of Reclamation.
[4] Separable costs are shown for the system and specific costs for individual projects.

MISSOURI RIVER MAIN STEM SYSTEM—Continued

STUDY NO. 1-D.—*Use of facilities, Missouri River main stem system*

[Figures in thousands of dollars]

	System					Fort Peck					Garrison				
	Flood control	Power	Navigation	Irrigation	Total	Flood control	Power	Navigation	Irrigation	Total	Flood control	Power	Navigation	Irrigation	Total
1. Separable costs	[1] ($89,820)	[2] ($576,860)	($55,200)	[3] ($117,449)	($837,329)										
(a) Construction cost	3,167	20,339	1,876	4,141											
(b) Interest during construction	177	1,207	99	235											
(c) Operation, maintenance and replacement	553	3,667	132	417											
(1) Total	3,897	25,213	2,107	4,793											
2. Taxes foregone		13,682													
3. Total annual assigned costs	3,897	38,895	2,107	4,793	49,692										
4. Percentage distribution of remaining costs on basis of capacity for equivalent service	15	35	25	25											
5. Remaining costs					($289,071)										
(a) Construction cost	$1,529	$3,567	$2,548	$2,548	$10,192										
(b) Interest during construction	98	230	165	165	658										
(c) Operation, maintenance and replacement	125	292	208	208	833										
(1) Total	1,752	4,089	2,921	2,921	11,683										
6. Total annual costs	5,649	42,772	5,028	7,714	61,375										
7. Capitalization, dam and reservoir costs:															
(a) Separable costs [4]	89,820	576,860	53,200	117,449	[5]37,329	$700	$39,800			$40,500	$6,000	$86,300			$9,3000
(b) Joint costs	43,380	101,140	72,300	72,251	289,071	17,700	39,000	$20,300	$40,300	117,300	30,300	67,000	$34,900	$69,300	201,500
Recreation					3,200					500					1,200
Total construction costs	133,200	678,000	125,500	189,700	1,129,600	18,400	78,800	20,300	40,300	158,300	36,300	153,300	34,900	69,300	295,000
8. Recapitulation of reimbursable power costs:															
(a) Dam and reservoir		678,000					78,800					153,300			

(b) Interest during construction		40,200					3,400					9,200			
(1) Total power investment		718,200					82,200					162,500			

	Oahe					Fort Randall				Gavins Point			
	Flood control	Power	Navigation	Irrigation	Total	Flood control	Power	Navigation	Total	Flood control	Power	Total	Bend, power
1. Separable costs													
(a) Construction cost													
(b) Interest during construction													
(c) Operation, maintenance and replacement													
(1) Total													
2. Taxes foregone													
3. Total annual assigned costs													
4. Percentage distribution of remaining costs on basis of capacity for equivalent service													
5. Remaining costs													
(a) Construction cost													
(b) Interest during construction													
(c) Operation, maintenance and replacement													
(1) Total													
6. Total annual costs													
7. Capitalization, dam and reservoir costs:													
(a) Separable costs [4]	$5,300	$118,000			$123,300	$3,200	$77,300		$80,500		$25,300	$25,300	$71,500
(b) Joint costs	35,200	77,500	$40,300	$80,100	233,100	26,300	57,700	$30,000	114,000	$8,500	18,600	27,100	
Recreation					400				500			600	
Total construction costs	40,500	195,500	40,300	80,100	356,800	29,500	135,000	30,000	195,000	8,500	43,900	53,000	71,500
8. Recapitulation of reimbursable power costs:													
(a) Dam and reservoir		195,500					135,000				43,900		71,500
(b) Interest during construction		13,200					9,500				1,300		3,600
(1) Total power investment		208,700					144,500				45,200		75,100

[1] Tentative flood-control benefit estimates exceed single-purpose alternative costs.
[2] Includes taxes foregone.
[3] Based on data furnished by Bureau of Reclamation.
[4] Separable costs are shown for the system and specific costs for individual projects.

NORFORK PROJECT—WHITE RIVER BASIN

STUDY NO. 3.—*Summary of results of applying various methods of cost allocation to the Norfork multiple-purpose (flood control and power) project, White River Basin, Ark.*

	Flood control	Power	Total
1. Separable costs, remaining benefits:			
(1) Allocation of joint investment costs [1]	$9,794,800	$12,475,400	$22,270,200
(2) Add specific investment costs [2]	618,200	7,341,600	7,959,800
(a) Total investment allocation	10,413,000	19,817,000	30,230,000
(3) Allocation of interest during construction	527,000	1,003,000	1,530,000
(4) Allocation of total construction costs	9,886,000	18,814,000	28,700,000
2. Alternative justifiable expenditures:			
(1) Allocation of joint investment costs [1]	10,444,700	11,825,500	22,270,200
(2) Add specific investment costs [2]	618,200	7,341,600	7,959,800
(a) Total investment allocation	11,062,900	19,167,100	30,230,000
(3) Allocation of interest during construction	560,000	970,000	1,530,000
(4) Allocation of total construction costs	10,502,900	18,197,100	28,700,000
3. Priority of use:			
(1) Allocation of joint investment costs [1]	15,519,800	6,750,400	22,270,200
(2) Add specific investment costs [2]	618,200	7,341,600	7,959,800
(a) Total investment allocation	16,138,000	14,092,000	30,230,000
(3) Allocation of interest during construction	817,000	713,000	1,530,000
(4) Allocation of total construction costs	15,321,000	13,379,000	28,700,000
4. Use of facilities:			
(1) Allocation of joint investment costs [1]	7,631,800	14,638,400	22,270,200
(2) Add specific investment costs [2]	618,200	7,341,600	7,959,800
(a) Total investment allocation	8,250,000	21,980,000	30,230,000
(3) Allocation of interest during construction	418,000	1,112,000	1,530,000
(4) Allocation of total construction costs	7,832,000	20,868,000	28,700,000
5. Average of separable costs; remaining benefits, alternative justifiable expenditures, priority of use, and use of facilities:			
(1) Allocation of joint investment costs [1]	10,847,800	11,422,400	22,270,200
(2) Add specific investment costs [2]	618,200	7,341,600	7,959,800
(a) Total investment allocation	11,466,000	18,764,000	30,230,000
(3) Allocation of interest during construction	580,500	949,500	1,530,000
(4) Allocation of total construction costs	10,885,500	17,814,500	28,700,000

[1] Costs related only to multiple functions, excluding powerplant, switchyard, outlet works exclusive of power, etc., including separable investment costs.
[2] Costs related to 1 function only, i. e., powerplant, switchyard, outlet works exclusive of power, etc.

NORFORK PROJECT—WHITE RIVER BASIN—Continued

STUDY NO. 3–A.—*Allocation by separable costs-remaining benefits method, Norfork multiple-purpose (flood control and power) project, White River Basin, Ark.*

	Flood control	Power	Total
1. Annual benefits	$823,000	$1,348,000	$2,171,000
2. Single-purpose alternative (investment)	16,138,000	26,593,000	42,731,000
(1) Investment cost	569,000	938,000	1,507,000
(2) Operation, maintenance, and replacements	95,000	225,000	320,000
(3) Taxes foregone		263,000	263,000
(a) Total	664,000	1,426,000	2,090,000
3. Justifiable investment [1]	664,000	1,348,000	2,012,000
4. Separable investment costs	[2](3,637,000)	[3](14,092,000)	(17,729,000)
(1) Investment cost	128,000	497,000	625,000
(2) Operation, maintenance, and replacements	35,000	165,000	200,000
(a) Total	163,000	662,000	825,000
5. Taxes foregone		263,000	263,000
6. Total annual assigned costs	163,000	925,000	1,088,000
7. Remaining benefits	501,000	423,000	924,000
8. Percent distribution	54.2	45.8	100.0
9. Remaining costs to be allocated			($12,501,000)
(1) Investment cost	$239,000	$202,000	441,000
(2) Operation and maintenance	33,000	27,000	60,000
(a) Total	272,000	229,000	501,000
10. Total annual costs (line 6 plus 9 (a))	435,000	1,154,000	1,589,000
11. Benefit-cost ratio	1.89	1.17	1.37
12. Capitalization of project investment costs:			
(1) Separable costs	[2] $3,637,000	[3] $14,092,000	[4] $17,729,000
(2) Joint costs	6,776,000	5,725,000	12,501,000
(a) Total investment costs	10,413,000	19,817,000	30,230,000
13. Interest during construction	527,000	1,003,000	1,530,000
14. Total construction cost	9,886,000	18,814,000	28,700,000
15. Final allocation of investment	10,413,000	19,817,000	30,230,000
16. Reimbursable power costs		19,817,000	

[1] Benefits limited by alternate costs.
[2] Includes $618,200 investment cost of specific flood-control features, outlet works exclusive of power.
[3] Includes $7,341,600 investment cost of specific power features, such as generators, switchyard, etc.

Norfork Project—White River Basin—Continued

Study No. 3-B.—*Allocation by alternate justifiable expenditure method, Norfork multiple-purpose (flood control and power) project, White River Basin, Ark.*

	Flood control	Power	Total
1. Benefits	$823,000	$1,348,000	$2,171,000
2. Single-purpose alternative (investment)	16,138,000	26,593,000	42,731,000
(1) Investment cost	569,000	938,000	1,507,000
(2) Operation, maintenance, and replacements	95,000	225,000	320,000
(3) Taxes foregone		263,000	263,000
(a) Total	664,000	1,426,000	2,090,000
3. Justifiable investment [1]	664,000	1,348,000	2,012,000
4. Less specific investment costs	(618,200)	(7,341,600)	(7,959,800)
(1) Investment cost	22,000	259,000	281,000
(2) Operation, maintenance, and replacements	6,000	105,000	111,000
(a) Total	28,000	364,000	392,000
5. Taxes foregone		263,000	263,000
6. Total annual specific investment costs	28,000	627,000	655,000
7. Remaining alternative	636,000	721,000	1,357,000
8. Percent distribution	46.9	53.1	100.0
9. Total joint costs to be allocated (investment)	($10,444,700)	($11,825,500)	($22,270,200)
(1) Investment cost	368,000	417,000	785,000
(2) Operation, maintenance, and replacements	70,000	79,000	149,000
(a) Total	438,000	496,000	934,000
10. Total annual costs (line 6 plus 9 (a))	466,000	1,123,000	1,589,000
Benefit-cost ratio	1.77	1.20	1.37
11. Project investment cost allocation:			
(1) Joint costs	$10,444,700	$11,825,500	$22,270,200
(2) Specific costs	618,200	7,341,600	7,959,800
(a) Total	11,062,900	19,167,100	30,230,000
12. Interest during construction	560,000	970,000	1,530,000
13. Total construction cost	10,502,900	18,197,100	28,700,000
14. Final allocation of investment	11,062,900	19,167,100	30,230,000
15. Reimbursable power costs		19,167,100	

[1] Benefits limited by alternate costs.

NORFORK PROJECT—WHITE RIVER BASIN—Continued

STUDY NO. 3–C.—*Allocation by priority-of-use method, Norfork multiple-purpose (flood control and power) project, White River Basin, Ark.*

	Flood control	Power	Total
1. Benefits	$823,000	$1,348,000	$2,171,000
2. Justifiable investment [1]	664,000	1,348,000	2,012,000
3. Separable investment costs [2]	(3,637,000)	(14,092,000)	(17,729,000)
(1) Investment cost	128,000	497,000	625,000
(2) Operation, maintenance, and replacements	35,000	165,000	200,000
(a) Total	163,000	662,000	825,000
4. Taxes foregone		263,000	263,000
5. Total annual assigned costs	163,000	925,000	1,088,000
6. Remaining justifiable investment	501,000	423,000	924,000
7. Remaining cost to be allocated			(12,501,000)
(1) Investment cost	441,000	0	441,000
(2) Operation, maintenance, and replacements	60,000	0	60,000
(a) Total	501,000	0	501,000
8. Total annual costs (line 5+7 (a))	664,000	925,000	1,589,000
Benefit-cost ratio	1.24	1.46	1.37
9. Capitalization of project investment costs:			
(1) Separable costs	$3,637,000	$14,092,000	$17,729,000
(2) Joint costs	12,501,000	0	12,501,000
(a) Total investment costs	16,138,000	14,092,000	30,230,000
10. Interest during construction	817,000	713,000	1,530,000
11. Total construction cost	15,321,000	13,379,000	28,700,000
12. Final allocation of investment	16,138,000	14,092,000	30,230,000
13. Reimbursable power costs		14,092,000	

[1] From line 3, study 3–A.
[2] From line 4, study 3–A.

NORFORK PROJECT—WHITE RIVER BASIN—Continued

STUDY NO. 3–D.—*Allocation by use of facilities method, Norfork multiple-purpose (flood control and power) project, White River Basin, Arkansas*

	Flood control	Power	Total
1. Benefits	$823,000	$1,348,000	$2,171,000
2. Single-purpose alternative (investment)	16,138,000	26,593,000	42,731,000
(1) Investment cost	569,000	938,000	1,507,000
(2) Operation, maintenance, and replacements	95,000	225,000	320,000
(3) Taxes foregone		263,000	263,000
(a) Total	664,000	1,426,000	2,090,000
3. Separable investment costs	(3,637,000)	(14,092,000)	(17,729,000)
(1) Investment costs	128,000	497,000	625,000
(2) Operation, maintenance, and replacements	35,000	165,000	200,000
(a) Total	163,000	662,000	825,000
4. Taxes foregone		263,000	263,000
5. Total annual assigned costs	163,000	925,000	1,088,000
6. Storage, acre-feet	732,000	[1] 1,251,000	1,983,000
7. Percent distribution	36.9	63.1	100.0
8. Remaining cost to be allocated			($12,501,000)
(1) Investment cost	$163,000	$278,000	441,000
(2) Operation, maintenance, and replacements	22,000	38,000	60,000
(a) Total	185,000	316,000	501,000
9. Total annual costs (line 5+8 (a))	348,000	1,241,000	1,589,000
10. Benefit-cost ratio	2.36	1.09	1.37
11. Capitalization of project investment costs:			
(1) Separable costs	$3,637,000	$14,092,000	$17,729,000
(2) Joint costs	4,613,000	7,888,000	12,501,000
(a) Total investment costs	8,250,000	21,980,000	30,230,000
12. Interest during construction	418,000	1,112,000	1,530,000
13. Total construction costs	7,832,000	20,868,000	28,700,000
14. Final allocation of investment	8,250,000	21,980,000	30,230,000
15. Reimbursable power costs		21,980,000	

[1] Includes 707,000 acre-feet power drawdown and 544,000 acre-feet dead storage.

STUDY NO. 3–E.—*Comparison of results of applying the separable costs-remaining benefits and alternative justifiable expenditure methods to the Norfork multiple-purpose (flood control and power) project, White River Basin, Ark.*

	Flood control	Power	Total
Separable costs-remaining benefits:			
Allocation of total joint investment costs:			
Separable joint [1]	$3,018,800	$6,750,400	$9,769,200
Remaining joint	6,776,000	5,725,000	12,501,000
Subtotal	9,794,800	12,475,400	22,270,200
Specific investment costs	618,200	7,341,600	7,959,800
Total investment cost allocation	10,413,000	19,817,000	30,230,000
Interest during construction allocation	527,000	1,003,000	1,530,000
Total construction cost allocation	9,886,000	18,814,000	28,700,000
Reimbursable power allocation		19,817,000	
Alternative justifiable expenditure method:			
Allocation of total joint investment costs	10,444,700	11,825,500	22,270,200
Specific investment costs	618,200	7,341,600	7,959,800
Total investment cost allocation	11,062,900	19,167,100	30,230,000
Interest during construction allocation	560,000	970,000	1,530,000
Total construction cost allocation	10,502,900	18,197,100	28,700,000
Reimbursable power allocation		19,167,100	

[1] Separable investment costs less specific investment costs.

Table Rock Project—White River Basin

Study No. 1.—*Summary of results of applying various methods of cost allocation to the Table Rock multiple-purpose (flood control and power) project White River Basin, Mo.*

	Flood control	Power	Total
1. Separable costs, remaining benefits:			
(1) Allocation of joint investment costs [1]	$16,199,200	$39,147,300	$55,346,500
(2) Add specific investment costs [2]	561,800	15,956,700	16,518,500
(a) Total investment allocation	16,761,000	55,104,000	71,865,000
(3) Allocation of interest during construction	738,000	2,427,000	3,165,000
(4) Allocation of total construction costs	16,023,000	52,677,000	68,700,000
2. Alternative justifiable expenditures:			
(1) Allocation of joint investment costs [1]	17,710,900	37,635,600	55,346,500
(2) Add specific investment costs [2]	561,800	15,956,700	16,518,500
(a) Total investment allocation	18,272,700	53,592,300	71,865,000
(3) Allocation of interest during construction	805,000	2,360,000	3,165,000
(4) Allocation of total construction costs	17,467,700	51,232,300	68,700,000
3. Priority of use:			
(1) Allocation of joint investment costs [1]	21,361,200	33,985,300	55,346,500
(2) Add specific investment costs [2]	561,800	15,956,700	16,518,500
(a) Total investment allocation	21,923,000	49,942,000	71,865,000
(3) Allocation of interest during construction	965,000	2,209,000	3,165,000
(4) Allocation of total construction costs	20,958,000	47,742,000	68,700,000
4. Use of facilities:			
(1) Allocation of joint investment costs [1]	12,948,200	42,398,300	55,346,500
(2) Add specific investment costs [2]	561,800	15,956,700	16,518,500
(a) Total investment allocation	13,510,000	58,355,000	71,865,000
(3) Allocation of interest during construction	595,000	2,570,000	3,165,000
(4) Allocation of total construction costs	12,915,000	55,785,000	68,700,000
5. Average of separable costs, remaining benefits, alternative justifiable, expenditure, priority of use, and use of facilities:			
(1) Allocation of joint investment costs [1]	17,054,900	38,291,600	55,346,500
(2) Allocation of specific investment costs [2]	561,800	15,956,700	16,518,500
(a) Total investment allocation	17,616,700	54,248,300	71,865,000
(3) Allocation of interest during construction	775,800	2,389,200	3,165,000
(4) Allocation of total construction costs	16,840,900	51,859,100	68,700,000

[1] Costs related only to multiple functions, excluding powerplant, switchyard, etc., includes separable investment costs.

[2] Costs relating to 1 function only, i. e., powerplant, switchyard, outlet works exclusive of power, etc.

TABLE ROCK PROJECT—WHITE RIVER BASIN—Continued

STUDY NO. 1–A.—*Allocation by separate costs—remaining benefits method, table rock multiple-purpose (flood control and power) project, White River Basin, Mo.*

	Flood control	Power	Total
1. Annual benefits	$836,000	$3,557,000	$4,393,000
2. Single-purpose alternative (investment)	24,692,000	61,509,000	86,201,000
(1) Investment cost	870,000	2,169,000	3,039,000
(2) Operation, maintenance, and replacements	68,000	243,000	311,000
(3) Taxes foregone		812,000	812,000
(a) Total	938,000	3,224,000	4,162,000
3. Justifiable investment [1]	836,000	3,224,000	4,060,000
4. Separable investment costs	[1] (10,356,000)	[2] (47,173,000)	(57,529,000)
(1) Investment cost	365,000	1,664,000	2,029,000
(2) Operation, maintenance, and replacements	45,000	220,000	265,000
(a) Total	410,000	1,884,000	2,294,000
5. Taxes foregone		812,000	812,000
6. Total annual assigned costs	410,000	2,696,000	3,106,000
7. Remaining benefits	426,000	528,000	954,000
8. Percent distribution	44.7	55.3	100.0
9. Remaining costs to be allocated			($14,336,000)
(1) Investment cost	$226,000	$279,000	505,000
(2) Operation, maintenance, and replacements	10,000	13,000	23,000
(a) Total	236,000	292,000	528,000
10. Total annual costs (line 6 + 9 (a))	646,000	2,988,000	3,634,000
11. Benefit-cost ratio	1.29	1.19	1.21
12. Capitalization of project investment costs:			
(1) Separabel costs	[2] $10,356,000	[2] $47,173,000	$57,529,000
(2) Joint costs	6,405,000	7,931,000	14,336,000
(a) Total investment costs	16,761,000	55,104,000	71,865,000
13. Interest during construction	738,000	2,427,000	3,165,000
14. Total construction cost	16,023,000	52,677,000	68,700,000
15. Final allocation of investment	16,761,000	55,104,000	71,865,000
16. Reimbursable power costs		55,104,000	

[1] Benefits limited by alternate costs.
[2] Includes $561,800 investment cost of specific flood-control features, outlet works exclusive of power.
[3] Includes $15,956,700 investment cost for specific power features such as generators, switchyard, etc.

TABLE ROCK PROJECT—WHITE RIVER BASIN—Continued

STUDY NO. 1–B.—*Allocation by alternative justifiable expenditures method, Table Rock multiple-purpose (flood control and power) project, White River Basin, Mo.*

	Flood control	Power	Total
1. Benefits	$836,000	$3,557,000	34,393,000
2. Single-purpose alternative (investment)	24,692,000	61,509,000	86,201,000
(1) Investment cost	870,000	2,169,000	3,039,000
(2) Operation, maintenance, and replacements	68,000	243,000	311,000
(3) Taxes foregone		812,000	812,000
(a) Total	938,000	3,224,000	4,162,000
3. Justifiable investment [1]	836,000	3,224,000	4,060,000
4. Less specific investment costs	(561,800)	(15,956,700)	(16,518,500)
(1) Investment cost	20,000	563,000	583,000
(2) Operation, maintenance, and replacements	6,300	130,900	137,200
(a) Total	26,300	693,900	720,200
5. Taxes foregone		812,000	812,000
6. Total annual specific investment costs	26,300	1,505,900	1,532,200
7. Remaining alternative	809,700	1,718,100	2,527,800
8. Percent distribution	32.0	68.0	100.0
9. Total joint costs to be allocated (investment)	($17,710,900)	($37,635,600)	($55,346,500)
(1) Investment cost	624,000	1,327,000	1,951,000
(2) Operation, maintenance, and replacements	48,300	102,500	150,800
(a) Total	672,300	1,429,500	2,101,800
10. Total annual costs (line 6 plus 9 (a))	698,600	2,935,400	3,634,000
Benefit-cost ratio	1.20	1.21	1.21
11. Project investment cost allocation:			
(1) Joint costs	$17,710,900	$37,635,600	$55,346,500
(2) Specific costs	561,800	15,956,700	16,518,500
(a) Total	18,272,700	53,592,300	71,865,000
12. Interest during construction	805,000	2,360,000	3,165,000
13. Total construction cost	17,467,700	51,232,300	68,700,000
14. Final allocation of investment	18,272,700	53,592,300	71,865,000
15. Reimbursable power costs		53,592,300	

[1] Benefits limited by alternate costs.

TABLE ROCK PROJECT—WHITE RIVER BASIN—Continued

STUDY NO. 1–C.—*Allocation by priority of use method, Table Rock multiple-purpose (flood control and power) project White River Basin, Mo.*

	Flood control	Power	Total
1. Benefits	$836,000	$3,557,000	$4,393,000
2. Justifiable investment [1]	836,000	3,224,000	4,060,000
3. Separable investment costs [2]	(10,356,000)	(47,173,000)	(57,529,000)
(1) Investment cost	365,000	1,664,000	2,029,000
(2) Operation, maintenance, and replacements	45,000	220,000	265,000
(a) Total	410,000	1,884,000	2,294,000
4. Taxes foregone		812,000	812,000
5. Total annual assigned costs	410,000	2,696,000	3,106,000
6. Remaining justifiable investment	426,000	528,000	954,000
7. Remaining costs to be allocated			(14,336,000)
(1) Investment cost	407,000	98,000	505,000
(2) Operation, maintenance, and replacements	19,000	4,000	23,000
(a) Total	426,000	102,000	528,000
8. Total annual costs (line 5+7 (a))	836,000	2,798,000	3,634,000
Benefit-cost ratio	1.00	1.27	1.21
9. Capitalization of project investment costs:			
(1) Separable costs	$10,356,000	$47,173,000	$57,529,000
(2) Joint costs	11,567,000	2,769,000	14,336,000
(a) Total investment costs	21,923,000	49,942,000	71,865,000
10. Interest during construction	965,000	2,200,000	3,165,000
11. Total construction cost	20,958,000	47,742,000	68,700,000
12. Final allocation of investment	21,923,000	49,942,000	71,865,000
13. Reimbursable power costs		49,942,000	

[1] From line 3, study 1–A.
[2] From line 4, study 1–A.

TABLE ROCK PROJECT—WHITE RIVER BASIN—Continued

STUDY 1–D.—*Allocation by use of facilities method, Table Rock multiple-purpose (flood control and power) project White River Basin, Mo.*

	Flood control	Power	Total
1. Benefits	$836,000	$3,557,000	$4,393,000
2. Single purpose alternative (investment)	24,692,000	61,509,000	86,201,000
(1) Investment cost	870,000	2,169,000	3,039,000
(2) Operation, maintenance, and replacements	68,000	243,000	311,000
(3) Taxes foregone		812,000	812,000
(a) Total	938,000	3,224,000	4,162,000
3. Separable investment costs	(10,356,000)	(47,173,000)	(57,529,000)
(1) Investment cost	365,000	1,664,000	2,029,000
(2) Operation, maintenance, and replacements	45,000	220,000	265,000
(a) Total	410,000	1,884,000	2,294,000
4. Taxes foregone		812,000	812,000
5. Total annual assigned costs	410,000	2,696,000	3,106,000
6. Storage, acre-feet	760,000	[1] 2,702,000	3,462,000
7. Percent distribution	22.0	78.0	100.0
8. Remaining costs to be allocated			($14,336,000)
(1) Investment cost	$111,000	$394,000	505,000
(2) Operation, maintenance, and replacements	5,000	18,000	23,000
(a) Total	116,000	412,000	528,000
9. Total annual costs (line 5+8 (a))	526,000	3,108,000	3,634,000
10. Benefit-cost ratio	1.59	1.14	1.21
11. Capitalization of project investment costs:			
(1) Separable costs	$10,356,000	$47,173,000	$57,529,000
(2) Joint costs	3,154,000	11,182,000	14,336,000
(a) Total investment costs	13,510,000	58,355,000	71,865,000
12. Interest during construction	595,000	2,570,000	3,165,000
13. Total construction costs	12,915,000	55,785,000	68,700,000
14. Final allocation of investment	13,510,000	58,355,000	71,865,000
15. Reimbursable power costs	58,355,000		

[1] Includes 1,932,000 acre-feet of power drawdown and 770,000 acre-feet of dead storage.

STUDY NO. 2.—*Comparison of results of applying the separable costs—remaining benefits and alternative justifiable expenditure methods to Table Rock multiple-purpose (flood control and power) project, White River Basin, Mo.*

	Flood control	Power	Total
Separable costs-remaining benefits:			
Allocation of total joint investment costs:			
Separable joint [1]	$9,794,200	$31,216,300	$41,010,500
Remaining joint	6,405,000	7,931,000	14,336,000
Subtotal	16,199,200	39,147,300	55,346,500
Specific investment costs	561,800	15,956,700	16,518,500
Total investment cost allocation	16,761,000	55,104,000	71,865,000
Interest during construction allocation	738,000	2,427,000	3,165,000
Total construction cost allocation	16,023,000	52,677,000	68,700,000
Reimbursable power allocation		55,104,000	
Alternative justifiable expenditure method:			
Allocation of total joint investment costs	17,710,900	37,635,600	55,346,500
Specific investment costs	561,800	15,956,700	16,518,500
Total investment cost allocation	18,272,700	53,592,300	71,865,000
Interest during construction allocation	805,000	2,360,000	3,165,000
Total construction cost allocation	17,467,700	51,232,300	68,700,000
Reimbursable power allocation		53,592,300	

[1] Separable investment costs less specific investment costs.

Bull Shoals Project—White River Basin

STUDY NO. 1.—*Summary of results of applying various methods of cost allocation to the Bull Shoals multiple-purpose (flood control and power) project, White River Basin, Ark.*

	Flood control	Power	Total
1. Separable cost-remaining benefits:			
(1) Allocation of joint investment costs [1]	$31,202,300	$27,102,100	$58,304,400
(2) Add specific investment costs [2]	3,062,700	19,359,900	22,422,600
(a) Total investment allocation	34,265,000	46,462,000	80,727,000
(3) Allocation of interest during construction	1,867,000	2,531,000	4,398,000
(4) Allocation of total construction costs	32,398,000	43,931,000	76,329,000
2. Alternative justifiable expenditures:			
(1) Allocation of joint investment costs [1]	32,650,500	25,653,900	58,304,400
(2) Add specific investment costs [2]	3,062,700	19,359,900	22,422,600
(a) Total investment allocation	35,713,200	45,013,800	80,727,000
(3) Allocation of interest during construction	1,946,000	2,452,000	4,398,000
(4) Allocation of total construction costs	33,767,200	42,561,800	76,329,000
3. Priority of use:			
(1) Allocation of joint investment costs [1]	38,635,300	19,669,100	58,304,400
(2) Add specific investment costs [2]	3,062,700	19,359,900	22,422,600
(a) Total investment allocation	41,698,000	39,029,000	80,727,000
(3) Allocation of interest during construction	2,272,000	2,126,000	4,398,000
(4) Allocation of total construction costs	39,426,000	36,903,000	76,329,000
4. Use of facilities:			
(1) Allocation of joint investment costs [1]	24,785,300	33,519,100	58,304,400
(2) Add specific investment costs [2]	3,062,700	19,359,900	22,422,600
(a) Total investment allocation	27,848,000	52,879,000	80,727,000
(3) Allocation of interest during construction	1,517,000	2,881,000	4,398,000
(4) Allocation of total construction costs	26,331,000	49,998,000	76,329,000
5. Average of separable costs-remaining benefits, alternative justifiable expenditures, priority of use, and use of facilities:			
(1) Allocation of joint investment costs [1]	31,818,400	26,486,000	58,304,400
(2) Add specific investment costs [2]	3,062,700	19,359,900	22,422,600
(a) Total investment allocation	34,881,100	45,845,900	80,727,000
(3) Allocation of interest during construction	1,900,500	2,497,500	4,398,000
(4) Allocation of total construction costs	32,980,600	43,348,400	76,329,000

[1] Costs related only to multiple functions, excluding powerplant, switchyard, outlet works exclusive of power, etc., including separable investment costs.
[2] Costs related to 1 function only, i. e., powerplant, switchyard, outlet works exclusive of power, etc.

Bull Shoals Project—White River Basin—Continued

Study No. 1–A.—*Allocation by separate costs—remaining benefits method, Bull Shoals multiple-purpose (flood control and power) project, White River Basin, Ark.*

	Flood control	Power	Total
1. Annual benefits	$2,695,000	$2,553,000	$5,248,000
2. Single-purpose alternative (investment)	41,698,000	63,586,000	105,284,000
(1) Investment cost	1,470,000	2,242,000	3,712,000
(2) Operation, maintenance, and replacements	140,000	300,000	440,000
(3) Taxes foregone	0	531,000	531,000
(a) Total	1,610,000	3,073,000	4,683,000
3. Justifiable investment [1]	1,610,000	2,553,000	4,163,000
4. Separable investment costs	[2](17,141,000)	[3](39,029,000)	(56,170,000)
(1) Investment cost	604,000	1,376,000	1,980,000
(2) Operation, maintenance, and replacements	85,000	245,000	330,000
(a) Total	689,000	1,621,000	2,310,000
5. Taxes foregone	0	531,000	531,000
6. Total annual assigned costs	689,000	2,152,000	2,841,000
7. Remaining benefits	921,000	401,000	1,322,000
8. Percent distribution	69.7	30.3	100.0
9. Remaining costs to be allocated			($24,557,000)
(1) Investment cost	$604,000	$262,000	866,000
(2) Operations, maintenance, and replacements	38,000	17,000	55,000
(a) Total	642,000	279,000	921,000
10. Total annual costs (line 6 plus 9 (a))	1,331,000	2,431,000	3,762,000
11. Benefit-cost ratio	2.02	1.05	1.40
12. Capitalization of project investment costs:			
(1) Separable costs	[2] $17,141,000	[3] $39,029,000	$56,170,000
(2) Joint costs	17,124,000	7,433,000	24,557,000
(a) Total investment costs	34,265,000	46,462,000	80,727,000
13. Interest during construction	1,867,000	2,531,000	4,398,000
14. Total construction cost	32,398,000	43,931,000	76,329,000
15. Final allocation of investment	34,265,000	46,462,000	80,727,000
16. Reimbursable power costs		46,462,000	

[1] Benefits limited by alternate costs.
[2] Includes $3,062,200 investment cost of specific flood-control features, outlet works exclusive of power.
[3] Includes $19,359,900 investment cost of specific power features, such as generators, switchyard, etc.

Bull Shoals Project—White River Basin—Continued

Study No. 1-B.—*Allocation by alternative justifiable expenditure method, Bull Shoals multiple-purpose (flood control and power) project, White River Basin, Ark.*

	Flood control	Power	Total
1. Benefits	$2,695,000	$2,553,000	$5,248,000
2. Single-purpose alternative (investment)	41,698,000	63,586,000	105,284,000
(1) Investment cost	1,470,000	2,242,000	3,712,000
(2) Operation, maintenance, and replacements	140,000	300,000	440,000
(3) Taxes foregone	0	531,000	531,000
(a) Total	1,610,000	3,073,000	4,683,000
3. Justifiable investment [1]	1,610,000	2,553,000	4,163,000
4. Less specific investment costs	(3,062,700)	(19,359,900)	(22,422,600)
(1) Investment cost	108,000	682,000	790,000
(2) Operation, maintenance, and replacements	17,000	173,000	190,000
(a) Total	125,000	855,000	980,000
5. Taxes foregone	0	531,000	531,000
6. Total annual specific investment costs	125,000	1,386,000	1,511,000
7. Remaining alternative	1,485,000	1,167,000	2,652,000
8. Percent distribution	56.0	44.0	100.0
9. Total joint costs to be allocated (investment)	($32,650,500)	($25,653,900)	($58,304,400)
(1) Investment cost	1,151,000	905,000	2,056,000
(2) Operation, maintenance, and replacements	109,000	86,000	195,000
(a) Total	1,260,000	991,000	2,251,000
10. Total annual costs (line 6+9 (a))	1,385,000	2,377,000	3,762,000
11. Benefit-cost ration	1.95	1.07	1.40
12. Project investment cost allocation:			
(1) Joint costs	$32,650,500	$25,653,900	$58,304,400
(2) Specific costs	3,062,700	19,359,900	22,422,600
(a) Total	35,713,200	45,013,800	80,727,000
13. Interest during construction	1,946,000	2,452,000	4,398,000
14. Total construction cost	33,767,200	42,561,800	76,329,000
15. Final allocation of investment	35,713,200	45,013,800	80,727,000
16. Reimbursable power costs		45,013,800	

[1] Benefits limited by alternate costs.

BULL SHOALS PROJECT—WHITE RIVER BASIN—Continued

STUDY NO. 1–C.—*Allocation by priority of use method, Bull Shoals multiple-purpose (flood control and power) project, White River Basin, Ark.*

	Flood control	Power	Total
1. Benefits	$2,695,000	$2,553,000	$5,248,000
2. Justifiable investment [1]	1,610,000	2,553,000	4,163,000
3. Separable costs [2]	(17,141,000)	(39,029,000)	(56,170,000)
(1) Investment cost	604,000	1,376,000	1,980,000
(2) Operation, maintenance, and replacements	85,000	245,000	330,000
(*a*) Total	689,000	1,621,000	2,310,000
4. Taxes foregone	0	531,000	531,000
5. Total annual assigned costs	689,000	2,152,000	2,841,000
6. Remaining justifiable investment	921,000	401,000	1,322,000
7. Remaining costs to be allocated			(24,557,000)
(1) Investment cost	866,000	0	866,000
(2) Operation, maintenance, and replacements	55,000	0	55,000
(*a*) Total	921,000	0	921,000
8. Total annual costs (line 5 plus 7 (*a*))	1,610,000	2,152,000	3,762,000
9. Benefit-cost ratio	1.67	1.19	1.40
10. Capitalization of project investment costs:			
(1) Separable costs	$17,141,000	$39,029,000	$56,170,000
(2) Joint costs	24,557,000	0	24,557,000
(*a*) Total investment costs	41,698,000	39,029,000	80,727,000
11. Interest during construction	2,272,000	2,126,000	4,398,000
12. Total construction cost	39,426,000	36,903,000	76,329,000
13. Final allocation of investment	41,698,000	39,029,000	80,727,000
14. Reimbursable power costs		39,029,000	

[1] From line 3, study 1–A.
[2] From line 4, study 1–A.

Bull Shoals Project—White River Basin—Continued

Study No. 1–D.—*Allocation by use of facilities method, Bull Shoals multiple-purpose (flood control and power) project, White River Basin, Ark.*

	Flood control	Power	Total
1. Benefits	$2,695,000	$2,553,000	$5,248,000
2. Single-purpose alternative (investment)	41,698,000	63,586,000	105,284,000
(1) Investment cost	1,470,000	2,242,000	3,712,000
(2) Operation, maintenance, and replacements	140,000	300,000	440,000
(3) Taxes foregone	0	531,000	531,000
(a) Total	1,610,000	3,073,000	4,683,000
3. Separable costs	(17,141,000)	(39,029,000)	(56,170,000)
(1) Investment cost	604,000	1,376,000	1,980,000
(2) Operation, maintenance, and replacements	85,000	245,000	330,000
(a) Total	689,000	1,621,000	2,310,000
4. Taxes foregone	0	531,000	531,000
5. Total annual assigned costs	689,000	2,152,000	2,841,000
6. Storage, acre-feet	2,360,000	[1] 3,048,000	5,408,000
7. Percent distribution	43.6	56.4	1.00
8. Remaining costs to be allocated			($24,557,000)
(1) Investment cost	$378,000	$488,000	866,000
(2) Operation, maintenance, and replacements	24,000	31,000	55,000
(a) Total	402,000	519,000	921,000
9. Total annual costs (line 5+8 (a))	1,091,000	2,671,000	3,762,000
10. Benefit-cost ratio	2.47	0.96	1.40
11. Capitalization of project investment costs:			
(1) Separable costs	$17,141,000	$39,029,000	$56,170,000
(2) Joint costs	10,707,000	13,850,000	24,557,000
(a) Total investment costs	27,848,000	52,879,000	80,727,000
12. Interest during construction	1,517,000	2,881,000	4,398,000
13. Total construction costs	26,331,000	49,998,000	76,329,000
14. Final allocation of investment	27,848,000	52,879,000	80,727,000
15. Reimbursable power costs		52,879,000	

[1] Includes 2,084,000 acre-feet power drawdown and 964,000 acre-feet dead storage.

Study No. 1–E.—*Comparison of results of applying the separable costs—remaining benefits and alternative justifiable expenditure methods to Bull Shoals multiple-purpose (flood control and power) project, White River Basin, Ark.*

	Flood control	Power	Total
Separable costs, remaining benefits:			
Allocation of total joint investment costs:			
Separable joint [1]	$14,078,300	$19,669,100	$33,747,400
Remaining joint	17,124,000	7,433,000	24,557,000
Subtotal	31,202,300	27,102,100	58,304,400
Specific investment costs	3,062,700	19,359,900	22,422,600
Total investment cost allocation	34,265,000	46,462,000	80,727,000
Interest during construction allocation	1,867,000	2,531,000	4,398,000
Total construction cost allocation	32,398,000	43,931,000	76,329,000
Reimbursable power allocation		46,462,000	
Alternative justifiable expenditure method:			
Allocation of total joint investment costs	32,650,500	25,653,900	58,304,400
Specific investment costs	3,062,700	19,359,900	22,422,600
Total investment cost allocation	35,713,200	45,013,800	80,727,000
Interest during construction allocation	1,946,000	2,452,000	4,398,000
Total construction cost allocation	33,767,200	42,561,800	76,329,000
Reimbursable power allocation		45,013,800	

[1] Separable investment costs less specific investment costs.

DENISON PROJECT

STUDY NO. 1.—*Summary of results of various methods of cost allocation*

	Power	Flood control	Water supply	Recreation	Total
1. Separable costs-remaining benefits:					
(1) Allocation of joint costs	$13,338,000	$32,030,000	$391,000	----------	$45,759,000
(2) Add specific costs	13,294,000	2,524,000	----------	$631,000	16,449,000
(3) Allocated project investment	26,632,000	34,554,000	391,000	631,000	62,208,000
2. Alternative justifiable expenditure:					
(1) Allocation of joint costs	14,590,000	30,778,000	391,000	----------	45,759,000
(2) Add specific costs	13,294,000	2,524,000	----------	631,000	16,449,000
(3) Allocated project investment	27,884,000	33,302,000	391,000	631,000	62,208,000
3. Priority of use:					
(1) Allocation of joint cost	6,533,000	38,835,000	391,000	----------	45,759,000
(2) Add specific costs	13,294,000	2,524,000	----------	631,000	16,449,000
(3) Allocated project investment	19,827,000	41,359,000	391,000	631,000	62,208,000
4. Use of facilities:					
(1) Allocation of joint cost	24,548,000	20,820,000	391,000	----------	45,759,000
(2) Add specific costs	13,294,000	2,524,000	----------	631,000	16,449,000
(3) Allocated project investment	37,842,000	23,344,000	391,000	631,000	62,208,000
5. Average, all methods:					
(1) Allocation of joint costs	14,752,000	30,616,000	391,000	----------	45,759,000
(2) Specific costs	13,294,000	2,524,000	----------	631,000	16,449,000
(3) Allocated project investment	28,046,000	33,140,000	391,000	631,000	62,208,000

DENISON PROJECT—Continued

STUDY NO. 1-A.—*Separable costs—Remaining benefits method*

	Power	Flood control	Total
1. Annual benefits	$1,584,000	$2,837,200	$4,421,200
2. Single-purpose alternative	(55,130,000)	(41,750,000)	
(1) Investment costs	1,943,770	1,472,020	
(2) Operation, maintenance and replacements	358,400	114,200	
(3) Taxes foregone	283,500		
(a) Total	2,585,670	1,586,220	
3. Justifiable investment	1,584,000	1,586,220	
4. Separable costs	(19,827,000)	(6,447,000)	
(1) Investment costs	699,060	227,310	
(2) Operation, maintenance and replacements	287,200	43,000	
(a) Total	986,260	270,310	
5. Taxes foregone	283,500		
6. Total annual assigned costs	1,269,760	270,310	1,540,070
7. Remaining benefits	314,240	1,315,910	1,630,150
8. Percent distribution	19.28	80.72	100.00
9. Remaining costs to be allocated			(35,303,000)
(1) Investment costs	$239,930	$1,004,780	$1,244,710
(2) Operation, maintenance and replacements	13,730	57,470	71,200
(a) Total	253,660	1,062,250	1,315,910
10. Total annual costs (line 6 plus 9 (a))	1,523,420	1,332,560	2,855,980
Benefit-cost ratio	1.04	2.13	1.55
11. Capitalization, project cost:			
(1) Separable costs	$19,827,000	$6,447,000	$26,274,000
(2) Joint costs	6,804,990	28,498,010	35,303,000
Public use			631,000
Total investment	26,631,990	34,945,010	62,208,000

LATER INCLUSION OF WATER SUPPLY ON BASIS OF PRORATA STORAGE COST

	Power	Flood control	Water supply	Total
12. Flood control costs to water supply: [1]				
(1) Annual costs			$13,800	
(2) Capitalization			391,400	
13. Adjusted investment	$26,631,990	$34,553,610	391,400	$61,577,000
Public use				631,000
Total				62,208,000
14. Construction charges	858,550	1,112,400	14,150	1,985,100
Public use				26,900
Construction cost	25,773,440	33,441,210	377,250	59,591,900
Public use				604,100
Total construction cost				60,196,000
15. Final allocation:				
Investment	26,631,990	34,553,610	391,400	61,577,000
Public use				631,000
Total				62,208,000

[1] Water supply has been included at Denison, at no increase project cost, by storing into the flood-control pool, but required only a relatively small amount of storage which can be evacuated in advance of flood and refilled from flood flows with no reduction in flood-control benefits. The annual project costs allocated to water supply have been determined as the prorata cost of the storage, including a proportional share of total project operation and maintenance, interest, and amortization. The project-cost allocation has been adjusted by transferring to water supply from the investment allocated to flood control an amount equal to the capitalized value of annual water supply charges.

DENISON PROJECT—Continued

STUDY NO. 1–B.—*Alternative justifiable expenditure method*

	Power	Flood control	Total
1. Annual benefits	$1,584,000	$2,837,200	$4,421,200
2. Single-purpose alternative	(55,130,000)	(41,750,000)	
(1) Investment cost	1,943,770	1,472,020	
(2) Operation, maintenance and replacements	358,400	114,200	
(3) Taxes foregone	283,500		
(a) Total	2,585,670	1,586,220	
3. Justifiable investment	1,584,000	1,586,220	
4. Less specific costs	(13,294,100)	(2,523,700)	(15,817,800)
(1) Investment cost	468,720	88,980	
(2) Operation, maintenance, and replacements	135,100	9,700	
(3) Taxes foregone	283,500		
(a) Total	887,320	98,680	986,000
5. Remaining alternative	696,680	1,487,540	2,184,220
6. Percent distribution	31.97	68.03	100.00
7. Total joint costs to be allocated			($45,759,200)
(1) Investment cost	$514,410	$1,098,970	1,613,380
(2) Operation, maintenance, and replacements	82,040	174,560	256,600
(a) Total	596,450	1,273,530	1,869,980
8. Total annual costs (line 4 (a) plus 7 (a))	1,483,770	1,372,210	2,855,980
Benefit-cost ratio	1.07	2.07	1.55
9. Capitalization, project cost:			
(1) Specific costs	$13,294,100	$2,523,700	$15,817,800
(2) Joint costs	14,589,800	31,169,400	45,759,200
Public use			631,000
Total investment	27,883,900	33,693,100	62,208,000

LATER INCLUSION OF WATER SUPPLY ON BASIS OF PRORATA STORAGE COST

	Power	Flood control	Water supply	Total
10. Flood control costs to water supply: [1]				
(1) Annual costs			$13,800	
(2) Capitalization			391,400	
11. Adjusted investment	$27,883,900	$33,301,700	391,400	$61,577,000
Public use				631,000
Total				62,208,000
12. Construction charges	898,900	1,072,050	14,150	1,985,100
Public use				26,000
Construction cost	26,985,000	32,229,650	377,250	59,591,900
Public use				604,100
Total construction cost				60,196,000
13. Final allocation:				
Investment	27,883,900	33,301,700	391,400	61,577,000
Public use				631,000
Total				62,208,000

[1] See note on study 1-A.

DENISON PROJECT—Continued

STUDY NO. 1–C.—*Priority of use*

	Power	Flood control	Total
1. Benefits	$1,584,000	$2,837,200	$4,421,200
2. Justifiable investment (line 3, study 1–A)	1,584,000	1,586,220	3,170,220
3. Separable cost	(19,827,000)	(6,447,000)	
(1) Investment cost	699,060	227,310	
(2) Operation, maintenance and replacements	287,200	43,000	
(a) Total	986,260	270,310	
4. Taxes foregone	283,500		
5. Total assigned costs	1,269,760	270,310	1,540,070
6. Remaining justifiable investment	314,240	1,315,910	1,630,150
7. Remaining cost to be allocated			(35,303,000)
(1) Investment		1,244,710	
(2) Operation, maintenance and replacements		71,200	
(a) Total		1,315,910	1,315,910
8. Total annual costs (line 5 plus 7 (a)	1,269,760	1,586,220	2,855,980
Benefit-cost ratio	1.25	1.79	1.55
9. Capitalization, project cost:			
(1) Separable cost	$19,827,000	$6,447,000	$26,274,000
(2) Joint cost		35,303,000	35,303,000
Public use			631,000
Total investment	19,827,000	41,750,000	62,208,000

LATER INCLUSION OF WATER SUPPLY ON BASIS OF PRORATA STORAGE COST

	Power	Flood control	Water supply	Total
10. Flood control costs to water supply: [1]				
(1) Annual costs			$13,800	
(2) Capitalization			391,400	
11. Adjusted investment	$19,827,000	$41,358,600	391,400	$61,577,000
Public use				631,000
Total				62,208,000
12. Construction charges	465,100	1,505,850	14,150	1,985,100
Public use				26,900
Construction cost	19,361,900	39,852,750	377,250	59,591,900
Public use				604,100
Total construction cost				60,196,000
13. Final allocation	19,827,000	41,358,600	391,400	61,577,000
Public use				631,000
Total				62,208,000

[1] See note on study 1–A.

DENISON PROJECT—Continued

STUDY NO. 1–D.—*Use of facilities method*

	Power	Flood control	Total
1. Separable costs	($19,827,000)	($6,447,000)	
2. Total annual assigned costs (line 6, study 1–A)	1,269,760	270,310	$1,540,070
3. Use of storage facility:			
(1) Active storage, acre-feet	1,814,000	2,690,700	4,504,700
(2) Power head only, acre-feet	990,000		990,000
Subtotal, acre-feet	2,804,000	2,690,700	5,494,700
(3) Percent distribution	(51.03)	(48.97)	(100.00)
(4) Dead storage, acre-feet			221,000
Total reservoir storage, acre-feet			5,715,700
4. Remaining costs to be allocated			($35,303,000)
(1) Investment costs	$635,180	$609,530	1,244,710
(2) Operation, maintenance and replacements	36,330	34,870	71,200
(a) Total	671,510	644,400	1,315,910
5. Total annual costs (line 2 plus 4 (a))	1,941,270	914,710	2,855,980
6. Benefits	1,584,000	2,837,200	4,421,200
Benefit-cost ratio	0.816	3.10	1.55
7. Capitalization of project costs:			
(1) Separable costs	$19,827,000	$6,447,000	$26,274,000
(2) Joint costs	18,015,200	17,287,800	35,303,000
Public use			631,000
Total investment	37,842,200	23,734,800	62,208,000

LATER INCLUSION OF WATER SUPPLY ON BASIS OF PRORATA STORAGE COST

	Power	Flood control	Water supply	Total
8. Flood control costs to water supply: [1]				
(1) Annual costs			$13,800	
(2) Capitalization			391,400	
9. Adjusted investment	$37,842,200	$23,343,400	391,400	$61,577,000
Public use				631,000
Total				62,208,000
10. Construction charges	1,219,900	751,050	14,150	1,985,100
Public use				26,900
Construction cost	36,622,300	22,592,350	377,250	59,591,900
Public use				604,100
Total construction cost				60,196,000
11. Final allocation:				
Investment	37,842,200	23,343,400	391,400	61,577,000
Public use				631,000
Total				62,208,000

[1] See note on study 1–A.

DENISON PROJECT—Continued

STUDY NO. 2.—*Comparison of results of applying the separable costs-remaining benefits and alternative justifiable expenditure methods*

	Power	Flood control	Water supply	Public use	Total
Separable costs-remaining benefits method:					
Allocation of total joint costs:					
Separable joint	$6,532,900	$3,923,300			$10,456,200
Remaining joint	6,804,990	28,106,610	$391,400		35,303,000
Subtotal	13,337,890	32,029,910	391,400		45,759,200
Specific costs	13,294,100	2,523,700		$631,000	16,448,800
Allocation, total investment	26,631,990	34,553,610	391,400	631,000	62,208,000
Construction charges	858,550	1,112,400	14,150	26,900	2,012,000
Allocation, total construction cost	25,773,440	33,441,210	377,250	604,100	60,196,000
Reimbursable power allocation	26,631,990				
Alternative justifiable expenditure method:					
Allocation of total joint costs	14,589,800	30,778,000	391,400		45,759,200
Specific costs	13,294,100	2,523,700		631,000	16,448,800
Allocation, total investment	27,883,900	33,301,700	391,400	631,000	62,208,000
Construction charges	898,900	1,072,050	14,150	26,900	2,012,000
Allocation, total construction cost	26,985,000	32,229,650	377,250	604,100	60,196,000
Reimbursable power allocation	27,883,900				

WHITNEY PROJECT—BRAZOS RIVER

STUDY NO. 1.—*Summary of results of applying various methods of cost allocations, Whitney Dam and Reservoir, Brazos River, Tex.*

	Flood control	Power	Streamflow regulation	Total
1. Separable costs-remaining benefits:				
(1) Allocation of joint costs	$32,041,200	$1,575,200	$2,982,800	$36,599,200
(2) Add specific costs	963,400	6,425,700		7,389,100
(3) Allocation of project investment	33,004,600	8,000,900	2,982,800	43,988,300
2. Alternative justifiable expenditure:				
(1) Allocation of joint costs	32,280,500	1,171,200	3,147,500	36,599,200
(2) Add specific costs	963,400	6,425,700		7,389,100
(3) Allocation of project investment	33,243,900	7,596,900	3,147,500	43,988,300
3. Priority of use:				
(1) Allocation of joint costs	32,041,200	1,575,200	2,982,800	36,599,200
(2) Add specific costs	963,400	6,425,700		7,389,100
(3) Allocation of project investment	33,004,600	8,000,900	2,982,800	43,988,300
4. Use of facilities:				
(1) Allocation of joint costs	31,285,000	3,927,800	1,386,400	36,599,200
(2) Add specific costs	963,400	6,425,700		7,389,100
(3) Allocation of project investment	32,248,400	10,353,500	1,386,400	43,988,300
5. Average of all methods:				
(1) Allocation of joint costs	31,912,000	2,062,300	2,624,900	36,599,200
(2) Add specific costs	963,400	6,425,700		7,389,100
(3) Allocation of project investment	32,875,400	8,488,000	2,624,900	43,988,300

NOTE.—Above figures are exclusive of $37,800 specific costs for recreation.

WHITNEY PROJECT—BRAZOS RIVER—Continued

STUDY NO. 1–A.—*Separable costs-remaining benefits allocation, Whitney Dam and Reservoir, Brazos River, Tex.*

	Flood control	Power	Streamflow regulation	Total
1. Annual benefits	$1,754,600	$522,000	$120,000	$2,396,600
2. Single-purpose alternative	(34,718,000)	(29,006,500)	(21,747,200)	
(1) Investment costs	1,224,100	1,022,800	766,800	
(2) Operation, maintenance, and replacement	67,800	188,900	42,300	
(3) Taxes foregone		135,700		
(a) Total	1,291,900	1,347,400	809,100	
3. Justifiable investment	1,291,900	522,000	120,000	
4. Separable costs	(14,981,800)	(8,000,900)		(22,982,700)
(1) Investment costs	528,200	282,100		810,300
(2) Operation, maintenance, and replacement	40,400	132,500		172,900
(a) Total	568,600	414,600		983,200
5. Taxes foregone		135,700		135,700
6. Total annual assigned costs	568,600	550,300		1,118,900
7. Remaining benefits (3–6)	723,300	0	120,000	843,300
8. Percent distribution	85.8	0.0	14.2	100.0
9. Remaining costs to be allocated				($21,005,600)
(1) Investment costs	$635,500	0	$105,200	740,700
(2) Operation, maintenance, and replacement	48,400	0	8,000	56,400
(a) Total	683,900	0	113,200	797,100
10. Total annual costs (6+9 (a))	1,252,500	$550,300	113,200	1,916,000
Benefit-cost ratio	1.40	0.95	1.06	1.25
11. Capitalization-project costs:				
(1) Separable costs	$14,981,800	$8,000,900		$22,982,700
(2) Joint costs	18,022,800	0	$2,982,800	21,005,600
(a) Total	33,004,600	8,000,900	2,982,800	43,988,300
12. Interest during construction	2,489,600	603,500	225,000	3,318,100
Construction cost	30,515,000	7,397,400	2,757,800	40,670,200
13. Final allocation of investment	33,004,600	8,000,900	2,982,800	43,988,300

NOTE.—Figures used in this study are from cost allocation report dated August 1954. Above figures are exclusive of $37,800 specific costs for recreation.

WHITNEY PROJECT—BRAZOS RIVER—Continued

STUDY NO. 1–B.—*Alternative justifiable expenditure method, Whitney Dam and Reservoir, Brazos River, Texas*

	Flood control	Power	Streamflow regulation	Total
1. Annual benefits	$1,754,600	$522,000	$120,000	$2,396,600
2. Single-purpose alternative	(34,718,000)	(29,006,500)	(21,747,200)	
(1) Investment costs	1,224,100	1,022,800	766,800	
(2) Operation, maintenance, and replacement	67,800	188,900	42,300	
(3) Taxes foregone		135,700		
(a) Total	1,291,900	1,347,400	809,100	
3. Justifiable investment	1,291,900	522,000	120,000	1,933,900
4. Less specific investment costs	(963,400)	(6,425,700)		(7,389,100)
(1) Investment costs	34,000	226,600		
(2) Operation, maintenance, and replacement	29,000	114,900		
(3) Taxes foregone		135,700		
(a) Total	63,000	477,200		540,200
5. Remaining alternative (3 minus 4 (a))	1,228,900	44,800	120,000	1,393,700
6. Percent distribution	88.2	3.2	8.6	100.0
7. Total joint costs to be allocated	($32,280,500)	($1,171,200)	($3,147,500)	($36,599,200)
(1) Investment costs	$1,138,100	$41,300	$111,000	$1,290,400
(2) Operation, maintenance, and replacement	75,300	2,700	7,400	85,400
(a) Total	1,213,400	44,000	118,400	1,375,800
8. Total annual costs (4 (a) plus 7 (a))	1,276,400	521,200	118,400	1,916,000
Benefit-cost ratio	1.37	1.00	1.01	1.25
9. Capitalization-project costs:				
(1) Specific costs	$963,400	$6,425,700		$7,389,100
(2) Joint costs	32,280,500	1,171,200	$3,147,500	36,599,200
(a) Total	33,243,900	7,596,900	3,147,500	43,988,300
10. Interest during construction	2,507,600	573,100	237,400	3,318,100
Construction cost	30,736,300	7,023,800	2,910,100	40,670,200
11. Final allocation of investment	33,243,900	7,596,900	3,147,500	43,988,300

NOTE.—Above figures are exclusive of $37,800 specific costs for recreation.

WHITNEY PROJECT—BRAZOS RIVER—Continued

STUDY NO. 1-C.—*Priority of use method, Whitney Dam and Reservoir, Brazos River, Tex.*

	Flood control	Power	Streamflow regulation	Total
1. Annual benefits	$1,754,600	$522,000	$120,000	$2,396,600
2. Justifiable investment [1]	$1,291,900	$522,000	$120,000	
3. Separable costs [2]	$568,600	$550,300		$1,118,900
4. Remaining justifiable investment	$723,300	0	$120,000	$843,300
5. Percent distribution	85.8	0	14.2	100.0
6. Allocation of joint costs	$683,900	0	$113,200	$797,100
7. Total annual costs	$1,252,500	$550,300	$113,200	$1,916,000
Benefit-cost ratio	1.40	0.95	1.06	1.25
8. Capitalization project costs: [3]				
(1) Separable costs	$14,981,800	$8,000,900	0	$22,982,700
(2) Joint costs	18,022,800		$2,982,800	21,005,600
(a) Total	33,004,600	8,000,900	2,982,800	43,988,300
9. Interest during construction [3]	2,489,600	603,500	225,000	3,318,100
Construction cost [3]	30,515,000	7,397,400	2,757,800	40,670,200
10. Final allocation of investment [3]	33,004,600	8,000,900	2,982,800	43,988,300

[1] Item 3, study 1-B.
[2] Item 6, study 1-A.
[3] Same as study 1-A.

NOTE.—Above figures are exclusive of $37,800 specific costs for recreation. There has been no order of priority of functions previously established for this project. In this allocation, power has been given minimum priority and flood control and streamflow regulation have been given equal priority, and therefore the functions are allocated in accordance with the remaining justifiable investment.

STUDY NO. 1-D.—*Use of facilities method, Whitney Dam and Reservoir, Brazos River, Texas*

	Flood control	Power	Streamflow regulation	Total
1. Separable costs (line 4, study 1-A)	($14,981,800)	($8,000,900)		($22,982,700)
2. Total annual assigned costs (line 6, study 1-A)	568,600	550,300		1,118,900
3. Use of storage facility:				
(1) Active storage, acre-feet	1,630,500	[1] 131,700	[1] 131,700	
(2) Power head only, acre-feet		91,100		91,100
(3) Total	1,630,500	222,800	131,700	1,985,000
Percent distribution	82.2	11.2	6.6	100.0
4. Allocation of remaining costs:				
(1) Investment costs	$608,800	$83,000	$48,900	$740,700
(2) Operation, maintenance, and replacement	46,400	6,300	3,700	56,400
(a) Total	655,200	89,300	52,600	797,100
5. Total annual costs (2 plus 4 (a))	1,223,800	639,600	52,600	1,916,000
6. Benefits	1,754,600	522,000	120,000	2,396,600
Benefit-cost ratio	1.43	0.82	2.28	1.25
7. Capitalization, project costs:				
(1) Separable costs	$14,981,800	$8,000,900		$22,982,700
(2) Joint costs	17,266,600	2,352,600	$1,386,400	21,005,600
(a) Total	32,248,400	10,353,500	1,386,400	43,988,300
8. Interest during construction	2,432,500	781,000	104,600	3,318,100
Construction cost	29,815,900	9,572,500	1,281,800	40,670,200
9. Final allocation of investment	32,248,400	10,353,500	1,386,400	43,988,300

[1] Active storage of 131,700 acre-feet is common to both power and streamflow regulation functions.

NOTE.—Above figures are exclusive of $37,800 specific costs for recreation.

WHITNEY PROJECT—BRAZOS RIVER—Continued

STUDY NO. 2.—*Comparison of results—Separable costs remaining benefits and alternative justifiable expenditure methods, Whitney Dam and reservoir, Brazos River, Tex.*

	Flood control	Power	Streamflow regulation	Total
Separable costs-remaining benefits method:				
1. Allocation of total joint costs:				
(1) Separable joint investment	$14,018,400	$1,575,200		$15,593,600
(2) Remaining joint investment	18,022,800		$2,982,800	21,005,600
Subtotal	32,041,200	1,575,200	2,982,800	36,599,200
2. Specific cost	963,400	6,425,700		7,389,100
3. Allocation of total investment	33,004,600	8,000,900	2,982,800	43,988,300
4. Interest during construction	2,489,600	603,500	225,000	3,318,100
5. Allocated total construction cost	30,515,000	7,397,400	2,757,800	40,670,200
6. Reimbursable power allocation		8,000,900		
Alternative justifiable expenditure method:				
1. Allocation of total joint costs	32,280,500	1,171,200	3,147,500	36,599,200
2. Specific cost	963,400	6,425,700		7,389,100
3. Allocation of total investment	33,243,900	7,596,900	3,147,500	43,988,300
4. Interest during construction	2,507,600	573,100	237,400	3,318,100
5. Allocated total construction cost	30,736,300	7,023,800	2,910,100	40,670,200
6. Reimbursable power allocation		7,596,900		

NOTE.—Above figures are exclusive of $37,800 specific costs for recreation.

Fort Gibson Project

Study No. 1.—*Summary of results of various methods of cost allocation for Fort Gibson Reservoir*

	Power	Flood control	Recreation	Total
1. Separable costs-remaining benefits:				
(1) Allocation of joint costs	$5,791,000	$27,288,000		$33,079,000
(2) Add specific costs	10,923,000	515,000	$340,000	11,778,000
(3) Allocated project investment	16,714,000	27,803,000	340,000	44,857,000
2. Alternative justifiable expenditure:				
(1) Allocation of joint costs	6,914,000	26,165,000		33,079,000
(2) Add specific costs	10,923,000	515,000	340,000	11,778,000
(3) Allocated project investment	17,837,000	26,680,000	340,000	44,857,000
3. Priority of use:				
(1) Allocation of joint costs	5,334,000	27,745,000		33,079,000
(2) Add specific costs	10,923,000	515,000	340,000	11,778,000
(3) Allocated project investment	16,257,000	28,260,000	340,000	44,857,000
4. Use of facilities:				
(1) Allocation of joint costs	8,607,000	24,472,000		33,079,000
(2) Add specific costs	10,923,000	515,000	340,000	11,778,000
(3) Allocated project investment	19,530,000	24,987,000	340,000	44,857,000
5. Average of all methods:				
(1) Allocation of joint costs	6,662,000	26,417,000		33,079,000
(2) Add specific costs	10,923,000	515,000	340,000	11,778,000
(3) Allocated project investment	17,585,000	26,932,000	340,000	44,857,000

Study No. 1-A.—*Separable costs—Remaining benefits method*

	Power	Flood control	Total
1. Annual benefits	$1,115,000	$1,392,400	$2,507,400
2. Single purpose alternative	(29,970,000)	(28,260,000)	
(1) Investment costs	1,056,680	996,390	
(2) Operation, maintenance and replacements	298,000	115,000	
(3) Taxes foregone	301,500		
(a) Total	1,656,180	1,111,390	
3. Justifiable investment	1,115,000	1,111,390	2,226,390
4. Separable costs	(16,257,000)	(14,547,000)	
(1) Investment costs	573,190	512,900	
(2) Operation, maintenance and replacements	221,000	38,000	
(a) Total	794,190	550,900	
5. Taxes foregone	301,500		
6. Total annual assigned costs	1,095,690	550,900	1,646,590
7. Remaining benefits	19,310	560,490	579,800
8. Percent distribution	3.33	96.67	100.00
9. Remaining costs to be allocated			($13,713,000)
(1) Investment cost	$16,100	$467,390	483,490
(2) Operation, maintenance, and replacements	2,570	74,430	77,000
(a) Total	18,670	541,820	560,490
10. Total annual costs (line 6 plus 9 (a))	1,114,360	1,092,720	2,207,080
Benefit-cost ratio	1.001	1.274	1.136
11. Capitalization of project cost:			
(1) Separable cost	$16,257,000	$14,547,000	$30,804,000
(2) Joint cost	456,660	13,256,340	13,713,000
Public use			340,000
Total investment	16,713,660	27,803,340	44,857,000
12. Interest during construction	1,069,640	1,779,360	2,849,000
Public use			8,000
Construction cost	15,644,020	26,023,980	41,668,000
Public use			332,000
Total construction cost			42,000,000
13. Final Allocation:			
Investment	16,713,660	27,803,340	44,517,000
Public use			340,000
Total			44,857,000

FORT GIBSON PROJECT—Continued

STUDY NO. 1-B.—*Alternative justifiable expenditure method*

	Power	Flood control	Total
1. Annual benefits	$1,115,000	$1,392,400	$2,507,400
2. Single-purpose alternative:			
(1) Investment cost	1,056,680	996,390	
(2) Operation, maintenance, and replacements	298,000	115,000	
(3) Taxes foregone	301,500		
(a) Total	1,656,180	1,111,390	
3. Justifiable investment	1,115,000	1,111,390	2,226,390
4. Less specific costs	(10,922,860)	(514,680)	(11,437,540)
(1) Investment cost	385,120	18,140	
(2) Operation, maintenance, and replacements	143,400	14,700	
(3) Taxes foregone	301,500		
(a) Total	830,020	32,840	862,860
5. Remaining alternative	284,980	1,078,550	1,363,530
6. Percent distribution	20.9	79.1	100.00
7. Total joint costs to be allocated			($33,079,460)
(1) Investment cost	$243,760	$922,560	1,166,320
(2) Operation, maintenance, and replacements	37,180	140,720	177,900
(a) Total	280,940	1,063,280	1,344,220
8. Total annual costs (line 4 (a) plus 7 (a))	1,110,960	1,096,120	2,207,080
Benefit-cost ratio	1.00	1.27	1.14
9. Capitalization, project cost:			
(1) Specific cost	$10,922,860	$514,680	$11,437,540
(2) Joint cost	6,913,670	26,165,790	33,079,460
Public use			340,000
Total investment	17,836,530	26,680,470	44,857,000
10. Interest during construction	1,141,510	1,707,490	2,849,000
Public use			8,000
Construction cost	16,695,020	24,972,980	41,668,000
Public use			332,000
Total construction cost			42,000,000
11. Final allocation:			
Investment	17,836,530	26,680,470	44,517,000
Public use			340,000
Total			44,857,000

FORT GIBSON PROJECT—Continued

STUDY NO. 1-C.—*Priority-of-use method*

	Power	Flood control	Total
1. Benefits	$1,115,000	$1,392,400	$2,507,400
2. Justifiable investment (line 3, study 1-A)	1,115,000	1,111,390	2,226,390
3. Separable cost	(16,257,000)	(14,547,000)	
(1) Investment cost	573,190	512,900	
(2) Operation, maintenance, and replacements	221,000	38,000	
(a) Total	794,190		
4. Taxes foregone	301,500		301,500
5. Total assigned costs	1,095,690	550,900	1,646,590
6. Remaining justifiable investment	19,310	560,490	579,800
7. Remaining cost to be allocated			(13,713,000)
(1) Investment cost		483,490	483,490
(2) Operation, maintenance, and replacements		77,000	77,000
(a) Total		560,490	560,490
8. Total annual costs (line 5 plus 7 (a))	1,095,690	1,111,390	2,207,080
9. Capitalization project cost:			
(1) Separable cost	16,257,000	14,547,000	30,804,000
(2) Joint cost		13,713,000	13,713,000
Public use			340,000
Total investment	16,257,000	28,260,000	44,857,000
10. Interest during construction	1,040,400	1,808,600	2,849,000
Public use			8,000
Construction cost	15,216,600	26,451,400	41,668,000
Public use			332,000
Total construction cost			42,000,000
11. Final allocation:			
Investment	16,257,000	28,260,000	44,517,000
Public use			340,000
Total			44,857,000

FORT GIBSON PROJECT—Continued

STUDY NO. 1–D.—*Use of facilities method*

	Power	Flood control	Total
1. Separable costs	($16,257,000)	($14,547,000)	
2. Total annual assigned costs (line 6, study 1–A)	1,095,690	550,900	$1,646,590
3. Use of storage facility:			
(1) Active storage, acre-feet	54,000	922,000	976,000
(2) Powerhead only, acre-feet	235,000		235,000
Subtotal, acre-feet	289,000	922,000	1,211,000
(3) Percent distribution	(23.865)	(76.135)	(100.00)
(4) Dead storage, acre-feet			76,000
Total reservoir storage, acre-feet			1,287,000
4. Remaining costs to be allocated			($13,713,000)
(1) Investment costs	$115,380	$368,110	483,490
(2) Operation, maintenance, and replacements	18,380	58,620	77,000
(a) Total	133,760	426,730	560,490
5. Total annual costs (line 2 plus 4 (a))	1,299,450	977,630	2,207,080
6. Benefits	1,115,000	1,392,400	2,507,400
(1) Benefit-cost ratio	0.907	1.424	1.136
7. Capitalization of project costs:			
(1) Separable costs	$16,357,000	$14,547,000	$30,804,000
(2) Joint costs	3,273,000	10,440,000	13,713,000
Public use			340,000
Total investment	19,530,000	24,987,000	44,857,000
8. Interest during construction	1,249,900	1,599,100	2,849,000
Public use			8,000
Construction cost	18,280,100	23,387,900	41,668,000
Public use			332,000
Total construction cost			42,000,000
9. Final allocation:			
Investment	19,530,000	24,987,000	44,517,000
Public use			340,000
Total			44,857,000

STUDY NO. 2.—*Comparison of results of applying the separable cost-remaining benefits and alternative justifiable expenditure methods*

	Power	Flood control	Public use	Total
Separable costs-remaining benefits method:				
Allocation of total joint costs:				
Separable joint	$5,334,140	$14,032,320		$19,366,460
Remaining joint	456,660	13,256,340		13,713,000
Subtotal	5,790,800	27,288,660		33,079,460
Specific costs	10,922,860	514,680	$340,000	11,777,540
Allocation, total investment	16,713,660	27,803,340	340,000	44,857,000
Interest during construction	1,069,640	1,779,360	8,000	2,857,000
Allocation, total construction cost	15,644,020	26,023,980	332,000	42,000,000
Reimbursable power allocation	16,713,660			
Alternative justifiable expenditure method:				
Allocation of total joint costs	6,913,670	26,165,790		33,079,460
Specific costs	10,922,860	514,680	340,000	11,777,540
Allocation, total investment	17,836,530	26,680,470	340,000	44,857,000
Interest during construction	1,141,510	1,707,490	8,000	2,857,000
Allocation, total construction cost	16,695,020	24,972,980	332,000	42,000,000
Reimbursable power allocation	17,836,530			

TENKILLER FERRY PROJECT

STUDY NO. 1.—*Summary of results of various methods of cost allocation*

	Power	Flood control	Recreation	Total
1. Separable costs-remaining benefits:				
(1) Allocation of joint costs	$3,894,000	$9,486,000		$13,380,000
(2) Add specific costs	8,388,000	1,794,000	$210,000	10,392,000
(3) Allocated project investment	12,282,000	11,280,000	210,000	23,772,000
2. Alternative justifiable expenditure:				
(1) Allocation of joint costs	2,888,000	10,492,000		13,380,000
(2) Add specific costs	8,388,000	1,794,000	210,000	10,392,000
(3) Allocated project investment	11,276,000	12,286,000	210,000	23,772,000
3. Priority of use:				
(1) Allocation of joint costs	3,894,000	9,486,000		13,380,000
(2) Add specific costs	8,388,000	1,794,000	210,000	10,392,000
(3) Allocated project investment	12,282,000	11,280,000	210,000	23,772,000
4. Use of facilities:				
(1) Allocation of joint costs	6,843,000	6,537,000		13,380,000
(2) Add specific costs	8,388,000	1,794,000	210,000	10,392,000
(3) Allocated project investment	15,231,000	8,331,000	210,000	23,772,000
5. Average, all methods:				
(1) Allocation of joint costs	4,380,000	9,000,000		13,380,000
(2) Specific costs	8,388,000	1,794,000	210,000	10,392,000
(3) Allocated project investment	12,768,000	10,794,000	210,000	23,772,000

STUDY 1–A.—*Separable costs-remaining benefits method*

	Power	Flood control	Total
1. Annual benefits	$689,000	$784,800	$1,473,800
2. Single-purpose alternative	(18,180,000)	(11,280,000)	
(1) Investment costs	640,990	397,710	
(2) Operation, maintenance, and replacements	205,300	76,800	
(3) Taxes foregone	187,600		
(a) Total	1,033,890	474,510	
3. Justifiable investment	689,000	474,510	1,163,510
4. Separable costs	(12,282,000)	(5,382,000)	
(1) Investment costs	433,040	189,760	
(2) Operation, maintenance, and replacements	153,200	24,700	
(a) Total	586,240	214,460	
5. Taxes foregone	187,600		
6. Total annual assigned costs	773,840	214,460	988,300
7. Remaining benefits		260,050	175,210
8. Percent distribution		100.00	
9. Remaining costs to be allocated			($5,898,000)
(1) Investment cost		$207,950	207,950
(2) Operation, maintenance, and replacements		52,100	52,100
(a) Total		260,050	260,050
10. Total annual costs (line 6 plus 9 (a))	$773,840	474,510	1,248,350
Benefit-cost ratio	0.89	1.65	1.18
11. Capitalization, project cost:			
(1) Separable cost	$12,282,000	$5,382,000	$17,664,000
(2) Joint cost		5,898,000	5,898,000
Public use			210,000
Total investment	12,282,000	11,280,000	23,772,000
12. Interest during construction	695,800	639,000	1,334,800
Public use			3,200
Construction cost	11,586,200	10,641,000	22,227,200
Public use			206,800
Total construction cost			22,434,000
13. Final allocation:			
Investment	12,282,000	11,280,000	23,562,000
Public use			210,000
Total			23,772,000

TENKILLER FERRY PROJECT—Continued

STUDY NO. 1–B.—*Alternative justifiable expenditure method*

	Power	Flood control	Total
1. Annual benefits	$889,000	$784,800	$1,473,800
2. Single-purpose alternative	(18,180,000)	(11,280,000)	
(1) Investment cost	640,990	397,710	
(2) Operation, maintenance and replacements	205,300	76,800	
(3) Taxes foregone	187,600		
(a) Total	1,033,890	474,510	
3. Justifiable investment	689,000	474,510	1,163,510
4. Less specific costs	(8,388,580)	(1,793,540)	(10,182,120)
(1) Investment cost	295,765	63,235	
(2) Operation, maintenance and replacements	101,600	9,900	
(3) Taxes foregone	187,600		
(a) Total	584,965	73,135	658,100
5. Remaining alternative	104,035	401,375	505,410
6. Percent distribution	21.58	78.42	100.00
7. Total costs to be allocated			($13,379,880)
(1) Investment cost	$101,805	$369,945	471,750
(2) Operation, maintenance and replacements	25,570	92,930	118,500
(a) Total	127,375	462,875	590,250
8. Total annual costs (line 4 (a) plus 7 (a))	712,340	536,010	1,248,350
Benefit-cost ratio	0.97	1.46	1.18
9. Capitalization, project cost:			
(1) Specific cost	$8,388,580	$1,793,540	$10,182,120
(2) Joint cost	2,887,420	10,492,460	13,379,880
Public use			210,000
Total investment	11,276,000	12,286,000	23,772,000
10. Interest during construction	638,790	696,010	1,334,800
Public use			3,200
Construction cost	10,637,210	11,589,990	22,227,200
Public use			206,800
Total construction cost			22,434,000
11. Final allocation:			
Investment	11,276,000	12,286,000	23,562,000
Public use			210,000
Total			23,772,000

TENKILLER FERRY PROJECT—Continued

STUDY 1–C.—*Priority of use*

	Power	Flood control	Total
1. Benefits	$689,000	$784,800	$1,473,800
2. Justifiable investment (line 3, study 1–A)	689,000	474,510	1,163,510
3. Separable cost	(12,282,000)	(5,382,000)	
(1) Investment costs	433,040	189,760	
(2) Operation, maintenance, and replacements	153,200	24,700	
(a) Total	586,240	214,460	
4. Taxes foregone	187,600		
5. Total annual assigned costs	773,840	214,460	988,300
6. Remaining justifiable investment		260,050	175,210
7. Remaining costs to be allocated			(5,898,000)
(1) Investment cost		207,950	
(2) Operation, maintenance, and replacements		52,100	
(a) Total		260,050	260,050
8. Total annual costs (line 5 plus 7 (a))	773,840	474,510	
Benefit-cost ratio	0.89	1.65	1.18
9. Capitalization, project cost:			
(1) Separable cost	$12,282,000	$5,382,000	$17,664,000
(2) Joint cost		5,898,000	5,898,000
Public use			210,000
Total investment	12,282,000	11,280,000	23,772,000
10. Interest during construction	695,800	639,000	1,334,800
Public use			3,200
Construction cost	11,586,200	10,641,000	22,227,200
Public use			206,800
Total construction cost			22,434,000
11. Final allocation:			
Investment	12,282,000	11,280,000	23,562,000
Public use			210,000
Total			23,772,000

TENKILLER FERRY PROJECT—Continued

STUDY 1–D.—*Use of facilities method*

	Power	Flood control	Total
1. Separable costs	($12,282,000)	($5,382,000)	
2. Total annual assigned costs (line 6, study 1–A)	773,840	214,460	
3. Use of storage facility:			
(1) Active storage, acre-feet	345,000	600,000	945,000
(2) Power head only, acre-feet	255,000		255,000
Subtotal, acre-feet	600,000	600,000	1,200,000
(3) Percent distribution	(50)	(50)	(100)
(4) Dead storage, acre-feet			30,000
Total reservoir storage, acre-feet			1,230,000
4. Remaining costs to be allocated			($5,898,000)
(1) Investment costs	$103,975	$103,975	207,950
(2) Operation, maintenance and replacements	26,050	26,050	52,100
(a) Total	130,025	130,025	0260,05
5. Total annual costs (line 2 plus 4 (a))	903,865	344,485	1,248,350
6. Benefits	689,000	784,800	1,473,800
Benefit-cost ratio	0.76	2.28	1.18
7. Capitalization of project costs:			
(1) Separable cost	$12,282,000	$5,382,000	$17,664,000
(2) Joint cost	2,949,000	2,949,000	5,898,000
Public use			210,000
Total investment	15,231,000	8,331,000	23,772,000
8. Interest during construction	862,800	472,000	1,334,800
Public use			3,200
Construction cost	14,368,200	7,859,000	22,227,200
Public use			206,800
Total construction cost			22,434,000
9. Final allocation:			
Investment	15,231,000	8,331,000	23,562,000
Public use			210,000
Total			23,772,000

STUDY NO. 2.—*Comparison of results of applying the separable costs-remaining benefits and alternative justifiable expenditure methods*

	Power	Flood control	Public Use	Total
Separable costs-remaining benefits method:				
Allocation of total joint costs:				
Separable joint	$3,893,420	$3,588,460		$7,481,880
Remaining joint		5,898,000		5,898,000
Subtotal	3,893,420	9,486,460		13,379,880
Specific costs	8,388,580	1,783,540	$210,000	10,392,120
Allocation, total investment	12,282,000	11,280,000	210,000	23,772,000
Interest during construction	695,800	639,000	3,200	1,338,000
Allocation, total construction cost	11,586,200	10,641,000	206,800	22,434,000
Reimbursable power allocation	12,282,000			
Alternative justifiable expenditure method:				
Allocation of total joint costs	2,887,420	10,492,460		13,379,880
Specific costs	8,388,580	1,793,540	210,000	10,392,120
Allocation, total investment	11,276,000	12,286,000	210,000	23,772,000
Interest during construction	638,790	696,010	3,200	1,338,000
Allocation, total construction cost	10,637,210	11,589,990	206,800	22,434,000
Reimbursable power allocation	11,276,000			

NARROWS PROJECT

TABLE 1.—*Summary of results cost allocation studies*

	Flood control	Power	Total
1. Separable cost-remaining benefits:			
(1) Allocation of joint reservoir costs	$7,372,000	$2,485,000	$9,857,000
(2) Add specific reservoir costs	519,000	2,863,000	3,382,000
(a) Subtotal reservoir allocation	7,891,000	5,348,000	13,239,000
(3) Interest during construction	263,000	150,000	413,000
(a) Final reservoir allocation	8,154,000	5,498,000	13,652,000
2. Alternative justifiable expenditure:			
(1) Allocation of joint reservoir costs	7,873,000	1,984,000	9,857,000
(2) Add specific reservoir costs	519,000	2,863,000	3,382,000
(a) Subtotal reservoir allocation	8,392,000	4,847,000	13,239,000
(3) Interest during construction	259,000	154,000	413,000
(a) Final reservoir allocation	8,651,000	5,001,000	13,652,000
3. Priority of use method:			
(1) Allocation of joint reservoir costs	7,372,000	2,485,000	9,857,000
(2) Add specific reservoir costs	519,000	2,863,000	3,382,000
(a) Subtotal reservoir allocation	7,891,000	5,348,000	13,239,000
(3) Interest during construction	263,000	150,000	413,000
(a) Final reservoir allocation	8,154,000	5,498,000	13,652,000
4. Use of facilities method:			
(1) Allocation of joint reservoir costs	3,938,000	5,919,000	9,857,000
(2) Add specific reservoir costs	519,000	2,863,000	3,382,000
(a) Subtotal reservoir allocation	4,457,000	8,782,000	13,239,000
(3) Interest during construction	80,000	333,000	413,000
(a) Final reservoir allocation	4,537,000	9,115,000	13,652,000
5. Average of all methods:			
(1) Allocation of joint reservoir costs	6,638,750	3,218,250	9,857,000
(2) Add specific reservoir costs	519,000	2,863,000	3,382,000
(a) Subtotal reservoir allocation	7,157,750	6,081,250	13,239,000
(3) Interest during construction	216,250	196,750	413,000
(a) Final reservoir allocation	7,374,000	6,278,000	13,652,000

NOTE.—Joint reservoir costs to flood control contains $548,000 for Little Missouri River Channel Improvement.

NARROWS PROJECT—Continued

TABLE 2.—*Separable cost-remaining benefits method cost allocation*

	Flood control	Power	Total
1. Annual benefits	$477,000	$354,000	$831,000
2. Single-purpose alternative	[1](7,891,000)	(10,958,000)	
(1) Construction cost	278,237	386,379	
(2) Interest during construction	9,273	15,832	
(3) Operation, maintenance, and replacement	99,000	171,000	
(4) Taxes foregone		72,000	
(a) Total	386,510	645,211	
3. Justifiable annual cost	386,510	354,000	
4. Separable cost, dam and reservoir	(1,733,000)	(5,348,000)	(7,081,000)
(1) Construction cost	61,106	188,570	249,676
(2) Interest during construction	−1,270	5,289	4,019
(3) Operation, maintenance, and replacement	15,000	106,000	121,000
(a) Total	74,836	299,859	374,695
5. Separable cost, Little Missouri channel improvement	(548,000)		(548,000)
(1) Construction cost	19,322		19,322
(2) Interest during construction	0		0
(3) Operation, maintenance, and replacement	19,000		19,000
(a) Total	38,322		38,322
6. Taxes foregone		72,000	72,000
7. Total annual assigned cost	113,158	371,859	485,017
8. Remaining benefits	273,352	None	273,352
9. Percent distribution	100	0	100
10. Remaining cost to be allocated	($5,610,000)	0	($5,610,000)
(1) Construction cost	$197,809	0	$197,809
(2) Interest during construction	10,543	0	10,543
(3) Operation, maintenance, and replacement	65,000	0	65,000
(a) Total	273,352	0	273,352
11. Total annual cost (line 7 and 10 (a))	386,510	$371,859	758,369
Benefit-cost ratio	1.23	0.95	1.10
12. Capitalization, construction costs:			
(1) Separable cost	$1,733,000	$5,348,000	$7,081,000
(2) Joint construction cost	5,610,000		5,610,000
(3) Little Missouri channel improvement	548,000		548,000
(a) Total construction cost	7,891,000	5,348,000	13,239,000
13. Recapitulation, project costs:			
(1) Dam and reservoir	[1] 7,891,000	5,348,000	[1] 13,239,000
(2) Interest during construction	263,000	150,000	413,000
14. Final allocation	8,154,000	5,498,000	13,652,000

[1] Includes $548,000 for Little Missouri River channel improvement.

NARROWS PROJECT—Continued

TABLE 3.—*Alternative justifiable expenditure method cost allocation*

	Flood control	Power	Total
1. Annual benefits	$477,000	$354,000	$831,000
2. Single-purpose alternative	[1] (7,891,000)	(10,958,000)	
(1) Construction cost	278,237	386,379	
(2) Interest during construction	9,273	15,832	
(3) Operation, maintenance and replacement	99,000	171,000	
(4) Taxes foregone		72,000	
(a) Total	386,510	645,211	
3. Justifiable annual cost	386,510	354,000	
4. Less specific cost dam and reservoir	(519,000)	(2,863,000)	(3,382,000)
(1) Construction cost	18,300	100,949	119,249
(2) Interest during construction	529	3,103	3,632
(3) Operation, maintenance and replacement	1,000	89,000	90,000
(4) Taxes foregone		72,000	72,000
(a) Total	19,829	265,052	284,881
5. Less specific cost Little Missouri channel improvement	(548,000)		(548,000)
(1) Construction cost	19,322		19,322
(2) Interest during construction	0		0
(3) Operation, maintenance and replacement	19,000		19,000
(a) Total	38,322		38,322
6. Remaining alternative	328,359	88,948	417,307
7. Percent distribution	78.69	21.31	100
8. Total joint costs to be allocated	($7,325,000)	($7,984,000)	($9,309,000)
(1) Construction cost	258,279	69,956	328,235
(2) Interest during construction	8,600	2,329	10,929
(3) Operation, maintenance and replacement	75,542	20,458	96,000
(a) Total	342,421	92,743	435,164
9. Total annual cost (lines 4 (a), 5 (a) and 8 (a))	400,572	357,795	758,367
Benefit-cost ratio	1.19	0.99	1.10
10. Capitalization, construction costs:			
(1) Joint reservoir cost	$7,325,000	$1,984,000	$9,309,000
(2) Specific costs:			
(a) Dam and reservoir	519,000	2,863,000	3,382,000
(b) Little Missouri channel improvement	548,000		548,000
(1) Total construction cost	8,392,000	4,847,000	13,239,000
11. Recapitulation of project costs:			
(1) Dam and reservoir	[1] 8,392,000	4,847,000	[1] 13,239,000
(2) Interest during construction	259,000	154,000	413,000
12. Final allocation	8,651,000	5,001,000	13,652,000

[1] Includes $548,000 for Little Missouri River channel improvement.

NARROWS PROJECT—Continued

TABLE 4.—*Priority of use method (flood control primary; power incremental), cost allocation*

	Flood control	Power	Total
1. Annual benefits	$477,000	$354,000	$831,000
2. Single-purpose alternative	[1](7,891,000)	(10,958,000)	
(1) Construction cost	278,237	386,379	
(2) Interest during construction	9,273	15,832	
(3) Operation, maintenance, and replacement	99,000	171,000	
(4) Taxes foregone		72,000	
(a) Total	386,510	645,211	
3. Justifiable annual cost	386,510	354,000	
4. Allocation, dam and reservoir	[1](7,891,000)	(5,384,000)	[1](13,239,000)
(1) Annual construction costs	278,237	188,570	466,807
(2) Interest during construction	9,273	5,289	14,562
(3) Operation, maintenance, and replacement	99,000	106,000	205,000
(a) Total	386,510	299,859	686,369
5. Taxes foregone		72,000	72,000
6. Total annual cost	386,510	371,859	758,369
Benefit-cost ratio	1.23	0.95	1.10
7. Recapitulation of project costs:			
(1) Construction costs	[1] $7,891,000	$5,348,000	[1] $13,239,000
(2) Interest during construction	263,000	150,000	413,000
8. Final allocation	[1] 8,154,000	5,498,000	[1] 13,652,000

[1] Includes $548,000 for Little Missouri River channel improvement.

NARROWS PROJECT—Continued

TABLE 5.—*Use of facilities method cost allocation*

	Flood control	Power	Total
1. Annual benefits	$477,000	$354,000	$831,000
2. Separable cost, dam and reservoir	(1,733,000)	(5,348,000)	(7,081,000)
(1) Construction cost	61,106	188,570	249,676
(2) Interest during construction	−1,270	5,289	4,019
(3) Operation, maintenance, and replacement	15,000	106,000	121,000
(a) Total	74,836	299,859	374,695
3. Separable cost, Little Missouri channel improvement	(548,000)		(548,000)
(1) Construction cost	19,322		19,322
(2) Interest during construction	0		0
(3) Operation, maintenance, and replacement	19,000		19,000
(a) Total	38,322		38,322
4. Taxes foregone		72,000	72,000
5. Total annual assigned cost	113,158	371,859	485,017
6. Assigned storage in acre-feet	128,000	202,000	330,000
7. Percent distribution	38.79	61.21	100
8. Remaining cost to be allocated	($2,176,000)	($3,434,000)	($5,610,000)
(1) Construction cost	$76,726	$121,083	$197,809
(2) Interest during construction	4,090	6,453	10,543
(3) Operation, maintenance, and replacement	25,214	39,786	65,000
(a) Total	106,030	167,322	273,352
9. Total annual cost (line 5 and 8 (a))	219,188	539,181	758,369
Benefit-cost ratio	2.18	.66	1.10
10. Capitalization, construction costs:			
(1) Separable costs	$1,733,000	$5,348,000	$7,081,000
(2) Joint construction costs	2,176,000	3,434,000	5,610,000
Little Missouri channel improvement	548,000		548,000
(a) Total construction cost	4,457,000	8,782,000	13,239,000
11. Recapitulation of project costs:			
(1) Construction costs	[1] 4,457,000	8,782,000	[1] 13,239,000
(2) Interest during construction	80,000	333,000	413,000
12. Final allocation	4,537,000	9,115,000	13,652,000

[1] Includes $548,000 for Little Missouri River channel improvement.

Blakely Mountain Project

Table 1.—*Summary of results cost allocation studies*

	Flood control	Power	Total
1. Separable cost-remaining benefits:			
(1) Allocation of joint reservoir costs	$4,357,000	$7,871,000	$12,228,000
(2) Add specific reservoir costs	3,275,000	15,297,000	18,572,000
(a) Subtotal reservoir allocation	7,632,000	23,168,000	30,800,000
(3) Interest during construction	459,000	1,843,000	2,302,000
(a) Final reservoir allocation	8,091,000	25,011,000	33,102,000
2. Alternative justifiable expenditure:			
(1) Allocation of joint reservoir costs	5,067,000	7,161,000	12,228,000
(2) Add specific reservoir costs	3,275,000	15,297,000	18,572,000
(a) Subtotal reservoir allocation	8,342,000	22,458,000	30,800,000
(3) Interest during construction	677,000	1,625,000	2,302,000
(a) Final reservoir allocation	9,019,000	24,083,000	33,102,000
3. Priority of use method:			
(1) Allocation of joint reservoir costs	7,526,000	4,702,000	12,228,000
(2) Add specific reservoir costs	3,275,000	15,297,000	18,572,000
(a) Subtotal reservoir allocation	10,801,000	19,999,000	30,800,000
(3) Interest during construction	345,000	1,957,000	2,302,000
(a) Final reservoir allocation	11,146,000	21,956,000	33,102,000
4. Use of facilities method:			
(1) Allocation of joint reservoir costs	3,242,000	8,986,000	12,228,000
(2) Add specific reservoir costs	3,275,000	15,297,000	18,572,000
(a) Subtotal reservoir allocation	6,517,000	24,283,000	30,800,000
(3) Interest during construction	499,000	1,803,000	2,302,000
(a) Final reservoir allocation	7,016,000	26,086,000	33,102,000
5. Average of all methods:			
(1) Allocation of joint reservoir costs	5,048,000	7,180,000	12,228,000
(2) Add specific reservoir costs	3,275,000	15,297,000	18,572,000
(a) Subtotal reservoir allocation	8,323,000	22,477,000	30,800,000
(3) Interest during construction	495,000	1,807,000	2,302,000
(a) Final reservoir allocation	8,818,000	24,284,000	33,102,000

BLAKELY MOUNTAIN PROJECT—Continued

TABLE 2.—*Separable cost-remaining benefits method cost allocation*

	Flood control	Power	Total
1. Annual benefits	$499,000	$1,651,000	$2,150,000
2. Single-purpose alternative	(10,801,000)	(26,338,000)	
(1) Construction cost	380,843	928,678	
(2) Interest during construction	12,165	60,964	
(3) Operation, maintenance and replacement	87,000	205,000	
(4) Taxes foregone		445,000	
(a) Total	480,008	1,639,642	
3. Justifiable annual cost	480,008	1,639,642	
4. Separable cost, dam and reservoir	(4,462,000)	(19,999,000)	(24,461,000)
(1) Construction cost	157,330	705,165	862,495
(2) Interest during construction	20,204	69,004	89,208
(3) Operation, maintenance and replacement	21,000	139,000	160,000
(a) Total	198,534	913,169	1,111,703
5. Taxes foregone		445,000	445,000
6. Total annual assigned cost	198,534	1,358,169	1,556,703
7. Remaining benefits	281,474	281,473	562,947
8. Percent distribution	50.00	50.00	100
9. Remaining cost to be allocated	($3,169,500)	($3,169,500)	($6,399,000)
(1) Construction cost	$111,757	$111,756	$223,513
(2) Interest during construction	−4,020	−4,019	−8,039
(3) Operation, maintenance and replacement	33,000	33,000	66,000
(a) Total	140,737	140,737	281,474
10. Total annual cost (line 6 and 9 (a)	339,271	1,498,906	1,838,177
Benefit-cost ratio	1.47	1.10	1.17
11. Capitalization, construction costs:			
(1) Separable costs	$4,462,000	$19,999,000	$24,461,000
(2) Joint construction costs	3,170,000	3,169,000	6,339,000
(a) Total construction costs	7,632,000	23,168,000	30,800,000
12. Recapitulation of project costs:			
(1) Construction costs	7,632,000	23,168,000	30,800,000
(2) Interest during construction	459,000	1,843,000	2,302,000
13. Final allocation	8,091,000	25,011,000	33,102,000

BLAKELY MOUNTAIN PROJECT—Continued

TABLE 3.—*Alternative justifiable expenditure method cost allocation*

	Flood control	Power	Total
1. Annual benefits	$499,000	$1,651,000	$2,150,000
2. Single-purpose alternative	(10,801,000)	(26,338,000)	
(1) Construction cost	380,843	928,678	
(2) Interest during construction	12,165	60,964	
(3) Operation, maintenance, and replacement	87,000	205,000	
(4) Taxes foregone		445,000	
(*a*) Total	480,008	1,639,642	
3. Justifiable annual cost	480,008	1,639,642	
4. Less specific cost	(3,275,000)	(15,297,000)	(18,572,000)
(1) Construction cost	115,476	539,372	654,848
(2) Interest during construction	8,639	35,789	44,428
(3) Operation, maintenance, and replacement	1,000	118,000	119,000
(4) Taxes foregone		445,000	445,000
(*a*) Total	125,115	1,138,161	1,263,276
5. Remaining alternative cost	354,893	501,481	856,374
6. Percent distribution	41.44	58.56	100
7. Total joint cost to be allocated	($5,067,000)	($7,161,000)	($12,228,000)
(1) Construction cost	178,662	252,497	431,159
(2) Interest during construction	15,225	21,516	36,741
(3) Operation, maintenance, and replacement	44,341	62,659	107,000
(*a*) Total	238,228	336,672	574,900
8. Total annual cost (line 4 (*a*) and 7 (*a*))	363,343	1,474,833	1,838,176
Benefit-cost ratio	1.37	1.12	1.17
9. Capitalization, construction costs:			
(1) Joint reservoir cost	$5,067,000	$7,161,000	$12,228,000
(2) Specific reservoir cost	3,275,000	15,297,000	18,572,000
(*a*) Total construction costs	8,342,000	22,458,000	30,800,000
10. Recapitulation of project costs:			
(1) Dam and reservoir	8,342,000	22,458,000	30,800,000
(2) Interest during construction	677,000	1,625,000	2,302,000
11[a] Final allocation	9,019,000	24,083,000	33,102,000

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BLAKELY MOUNTAIN PROJECT—Continued

TABLE 4.—*Priority of use method (flood control primary, power incremental), cos allocation*

	Flood control	Power	Total
1. Annual benefits	$499,000	$1,651,000	$2,150,000
2. Single-purpose alternative	(10,801,000)	(26,338,000)	
(1) Construction cost	380,843	928,678	
(2) Interest during construction	12,165	60,964	
(3) Operation, maintenance, and replacement	87,000	205,000	
(4) Taxes foregone		445,000	
(a) Total	480,008	1,639,642	
3. Justifiable annual cost	480,008	1,639,642	
4. Allocation, dam, and reservoir	(10,801,060)	(19,999,000)	(30,800,000)
(1) Annual construction cost	380,843	705,165	1,086,008
(2) Interest during construction	12,165	69,004	81,169
(3) Operation, maintenance, and replacement	87,000	139,000	226,000
(a) Total	480,008	913,169	1,393,177
5. Taxes foregone		445,000	445,000
6. Total annual cost	480,008	1,358,169	1,838,177
Benefit-cost ratio	1.04	1.22	1.17
7. Recapitulation of project costs:			
(1) Construction costs	$10,801,000	$19,999,000	$30,800,000
(2) Interest during construction	345,000	1,957,000	2,302,000
8. Final allocation	11,146,000	21,956,000	33,102,000

TABLE 5.—*Use of facilities method cost allocation*

	Flood control	Power	Total
1. Annual benefits	$499,000	$1,651,000	$2,150,000
2. Separable cost, dam and reservoir	(4,462,000)	(19,999,000)	
(1) Construction cost	157,330	705,165	
(2) Interest during construction	20,204	69,004	
(3) Operation, maintenance, and replacement	21,000	139,000	
(a) Total	198,534	913,169	
3. Taxes foregone		445,000	445,000
4. Total assigned costs	198,534	1,358,169	1,556,703
5. Assigned storage, acre-feet	617,000	1,286,000	1,903,000
6. Percent distribution	32.42	67.58	100
7. Remaining cost to be allocated	($2,055,000)	($4,284,000)	($6,339,000)
(1) Construction cost	$72,459	$151,054	$223,513
(2) Interest during construction	−2,606	−5,433	−8,039
(3) Operation, maintenance, and replacement	21,397	44,603	66,000
(a) Total	91,250	190,224	281,474
8. Total annual cost (line 4+7 (a)	289,784	1,548,393	1,838,177
Benefit-cost ratio	1.72	1.07	1.17
9. Capitalization, construction costs:			
(1) Separable costs	$4,462,000	$19,999,000	$24,461,000
(2) Joint construction costs	2,055,000	4,284,000	6,339,000
(a) Total	6,517,000	24,283,000	30,800,000
10. Recapitulation of project costs:			
(1) Construction costs	6,517,000	24,283,000	30,800,000
(2) Interest during construction	499,000	1,803,000	2,302,000
11. Final allocation	7,016,000	26,086,000	33,102,000

McNary Project—Columbia River Basin

TABLE 1.—*McNary lock and dam—Cost allocation studies, summary and average of 4 cost allocation methods (July 1, 1956, costs)*

Item	Navigation	Power	Total [1]
1. Separable costs-remaining benefits method:			
(a) Construction expenditures:			
(1) Allocated joint use [2]	$2,545,700	$133,519,300	$136,065,000
(2) Specific [3]	21,040,600	127,718,200	148,758,800
(3) Total	23,586,300	261,237,500	284,823,800
(b) Interest during construction, total	2,013,400	19,489,500	21,502,900
(c) Investment, total	25,599,700	280,727,000	306,326,700
2. Alternative justifiable expenditure method:			
(a) Construction expenditures:			
(1) Allocated joint use [2]	2,498,700	133,566,300	136,065,000
(2) Specific [3]	21,040,600	127,718,200	148,758,800
(3) Total	23,539,300	261,284,500	284,823,800
(b) Interest during construction, total	2,013,400	19,489,500	21,502,900
(c) Investment, total	25,552,700	280,774,000	306,326,700
3. Priority-of-use method:			
(a) Construction expenditures:			
(1) Allocated joint use [2]	2,476,000	133,589,000	136,065,000
(2) Specific [3]	21,040,600	127,718,200	148,758,800
(3) Total	23,516,600	261,307,200	284,823,800
(b) Interest during construction, total	2,083,400	19,419,500	21,502,900
(c) Investment, total	25,600,000	280,726,700	306,326,700
4. Use of facilities method:			
(a) Construction expenditures:			
(1) Allocated joint use [2]	68,759,100	67,305,900	136,065,000
(2) Specific [3]	21,040,600	127,718,200	148,758,800
(3) Total	89,799,700	195,024,100	284,823,800
(b) Interest during construction, total	6,430,300	12,670,700	19,101,000
(c) Investment, total	96,230,000	207,694,800	303,924,800
5. Average of methods 1, 2, and 3:			
(a) Construction expenditures:			
(1) Allocated joint use [2]	2,506,800	133,558,200	136,065,000
(2) Specific [3]	21,040,600	127,718,200	148,758,800
(3) Total	23,547,400	261,276,400	284,823,800
(b) Interest during construction, total	2,036,700	19,466,200	21,502,900
(c) Investment, total	25,584,100	280,742,600	306,326,700

[1] Excluding costs of recreation facilities as follows:

Construction expenditures	$176,200
Interest during construction	1,100
Total	177,300

[2] Costs related only to multiple or joint use operation, excluding powerplant and associated facilities, navigation lock, and downstream channel.

[3] Costs related to 1 functional operation only, i. e., powerplant and associated facilities or navigation lock and downstream channel.

McNary Project—Columbia River Basin—Continued

TABLE 2.—*McNary lock and dam—Cost allocation studies, allocation of costs-separable costs-remaining benefits method (July 1, 1956, costs and benefits)*

Item	Navigation	Power	Total [1]
1. Benefits	$1,081,000	$20,951,000	$22,032,000
2. Allocation of project annual costs:			
(a) Alternate costs	6,240,000	14,640,000	20,880,000
(b) Benefits as limited by alternate costs	1,081,000	14,640,000	15,721,000
(c) Separable costs	967,000	9,367,000	10,334,000
(d) Remaining benefits	114,000	5,273,000	5,387,000
(e) Percent remaining benefits	2.116	97.884	100
(f) Allocated remaining costs, joint	$111,600	$5,161,400	$5,273,000
(g) Total allocation, economic costs	1,078,700	14,528,400	15,607,000
(h) Taxes foregone	0	2,021,000	2,021,000
(i) Total allocation, project costs	1,078,600	12,507,400	13,586,000
3. Allocation of major replacements:			
(a) Separable costs	27,000	693,000	720,000
(b) Allocated remaining costs, joint	2,500	117,500	120,000
(c) Total allocation	29,500	810,500	840,000
(d) Percent total allocation	3.512	96.488	100
(e) Specific costs	$27,000	$641,000	$668,000
(f) Allocated joint use costs	$2,500	$169,500	$172,000
(g) Percent joint use costs	1.453	98.547	100
4. Allocation of operation and maintenance:			
(a) Separable costs	$133,000	$1,179,000	$1,312,000
(b) Allocated remaining costs, joint	13,400	619,600	633,000
(c) Total allocation	146,400	1,798,600	1,945,000
(d) Percent total allocation	7.527	92.473	100
(e) Specific costs	$133,000	$980,000	$1,113,000
(f) Allocated joint use costs	$13,400	$818,600	$832,000
(g) Percent joint use costs	1.611	98.389	100
5. Allocation of interest and amortization:			
(a) Separable costs	$807,000	$5,474,000	$6,281,000
(b) Allocated remaining costs, joint	85,600	4,424,400	4,520,000
(c) Total allocation	902,600	9,898,400	10,801,000
(d) Percent total allocation	8.357	91.643	100
(e) Specific costs	$807,000	$4,737,000	$5,544,000
(f) Allocated joint use costs	$95,600	$5,161,400	$5,257,000
(g) Percent joint use costs	1.819	98.181	100
6. Allocation of investment:			
(a) Separable costs	$22,887,000	$155,238,300	$178,125,300
(b) Allocated remaining costs, joint	2,712,700	125,488,700	128,201,400
(c) Total allocation	25,599,700	280,727,000	306,326,700
(d) Percent total allocation	8.357	91.643	100
(e) Specific costs	$22,887,000	$134,351,800	$157,238,800
(f) Allocated joint use costs	$2,712,700	$146,375,200	$149,087,900
(g) Percent joint use costs	1.820	98.180	100
7. Allocation of interest during construction:			
(a) Total allocation	$2,013,400	$19,489,500	$21,502,900
(b) Percent total allocation	9.363	90.637	100
(c) Specific costs	$1,846,400	$6,633,600	$8,480,000
(d) Allocated joint use costs	$167,000	$12,855,900	$13,022,900
(e) Percent joint use costs	1.282	98.718	100
8. Allocation of construction costs:			
(a) Total allocation	$23,586,300	$261,237,500	$284,823,800
(b) Percent total allocation	8.281	91.719	100
(c) Specific costs	$21,040,600	$127,718,200	$148,758,800
(d) Allocated joint use costs	$2,545,700	$133,519,300	$136,065,000
(e) Percent joint use costs	1.871	98.129	100
9. Ratio of benefits to allocated costs:			
(a) Total allocation	1.00 to 1	1.44 to 1	1.41 to 1

[1] Exclusive of recreation costs and benefits and irrigation benefits.

McNary Project—Columbia River Basin—Continued

TABLE 3.—*McNary lock and dam—cost allocation studies, allocation of costs-alternative justifiable expenditures method (July 1, 1956, costs and benefits)* [1]

Item	Navigation	Power	Total [2]
1. Benefits	$1,081,000	$20,951,000	$22,032,000
2. Allocation of total annual costs:			
(a) Alternate annual cost	6,240,000	14,640,000	20,880,000
(b) Benefits as limited by alternate costs	1,081,000	14,640,000	15,721,000
(c) Specific costs	967,000	8,379,000	9,346,000
(d) Remaining limited benefits	114,000	6,261,000	6,375,000
(e) Percent remaining benefits	1.788	98.212	100
(f) Allocated joint costs	$112,000	$6,149,000	$6,261,000
(g) Total allocation, economic costs	$1,079,000	$14,528,000	$15,607,000
(h) Taxes foregone	0	2,021,000	2,021,000
(i) Total allocation, project costs	1,079,000	12,507,000	13,586,000
3. Allocation of major replacements:			
(a) Specific costs	$27,000	$641,000	$668,000
(b) Allocated joint use costs	$3,100	$168,900	$172,000
(c) Percent joint use costs	1.788	98.212	100
(d) Total allocation	$30,100	$809,900	$840,000
(e) Percent total allocation	3.583	96.417	100
4. Allocation of operation and maintenance:			
(a) Specific costs	$133,000	$980,000	$1,113,000
(b) Allocated joint use costs	$14,900	$817,100	$832,000
(c) Percent joint use costs	1.788	98.212	100
(d) Total allocation	$147,900	$1,797,100	$1,945,000
(e) Percent total allocation	7.604	92.396	100
5. Allocation of interest and amortization:			
(a) Specific costs	$807,000	$4,737,000	$5,544,000
(b) Allocated joint use costs	$94,000	$5,163,000	$5,257,000
(c) Percent joint use costs	1.788	98.212	100
(d) Total allocation	$901,000	$9,900,000	$10,801,000
(e) Percent total allocation	8.342	91.658	100
6. Allocation of investment:			
(a) Specific costs	$22,887,000	$134,351,800	$157,238,800
(b) Allocated joint use costs	$2,665,700	$146,422,200	$149,087,900
(c) Percent joint use costs	1.788	98.212	100
(d) Total allocation	$25,552,700	$280,774,000	$306,326,700
(e) Percent total allocation	8.342	91.658	100
7. Allocation of interest during construction:			
(a) Specific costs	$1,846,400	$6,633,600	$8,480,000
(b) Allocated joint use costs	$167,000	$12,855,900	$13,022,900
(c) Percent joint use costs	1.282	98.718	100
(d) Total allocation	$2,013,400	$19,489,500	$21,502,900
(e) Percent toal allocation	9.363	90.637	100
8. Allocation of construction costs:			
(a) Specific costs	$21,040,600	$127,718,200	$148,758,800
(b) Allocated joint use costs	$2,498,700	$133,566,300	$136,065,000
(c) Percent joint use costs	1.836	98.164	100
(d) Total allocation	$23,539,300	$261,284,500	$284,823,800
(e) Percent total allocation	8.265	91.735	100
9. Ratio of benefits to allocated costs:			
(a) Total allocation	1.00 to 1	1.44 to 1	1.41 to 1

[1] Alternate costs, specific costs and all total costs identical to data as shown for separable costs-remaining benefits method computations.

[2] Exclusive of recreation cost and benefits and irrigation benefits.

McNary Project—Columbia River Basin—Continued

TABLE 4.—*McNary lock and dam—Cost allocation studies, allocation of costs-priority of use method*

Item	Navigation	Power	Total
1. Annual benefits and costs:			
(a) Annual benefits	$1,081,000	$20,951,000	$22,032,000
(b) Alternate costs, annual	6,240,000	14,640,000	20,880,000
(c) Justifiable costs	1,081,000	14,640,000	15,721,000
(d) Less specific costs	967,000	8,379,000	9,346,000
(e) Remaining justifiable costs	114,000	6,261,000	6,375,000
(f) Allocation of joint reservoir costs	114,000	6,147,000	6,263,000
(g) Total allocation	1,081,000	14,526,000	15,607,000
(h) Taxes foregone	0	2,021,000	2,021,000
(i) Allocated project costs	1,081,000	12,505,000	13,586,000
2. Operation, maintenance, and replacement:			
(a) Specific	160,000	1,621,000	1,781,000
(b) Joint	18,000	986,000	1,004,000
(c) Total	178,000	2,607,000	2,785,000
(d) Investment costs	903,000	9,898,000	10,801,000
3. Investment costs:			
(a) Total	25,600,000	280,726,700	306,326,700
(b) Specific	22,887,000	134,351,800	157,238,800
(c) Joint	2,713,000	146,374,900	149,087,900
4. Construction costs:			
(a) Interest during construction	2,083,400	19,419,500	21,502,900
(b) Construction cost:			
(1) Total	23,516,600	261,307,200	284,823,800
(2) Specific	21,040,600	127,718,200	148,758,800
(3) Joint	2,476,000	133,589,000	136,065,000

McNary Project—Columbia River Basin—Continued

TABLE 5.—*McNary lock and dam—Cost allocation studies, allocation of costs-use of facilities method* [1] *(July 1, 1956, costs and benefits)*

Item	Navigation	Power	Total [2]
1. Benefits	$1,081,000	$20,951,000	$22,032,000
2. Allocation of project annual costs:			
(a) Alternate annual cost	6,240,000	14,555,000	20,795,000
(b) Specific costs	967,000	8,379,000	9,346,000
(c) Allocated joint use costs	3,088,000	3,088,000	6,176,000
(d) Percent joint use costs	50	50	100
(e) Total allocation, economic costs	$4,055,000	$11,467,000	$15,522,000
(f) Taxes foregone	0	2,021,000	2,021,000
(g) Total allocation, project costs	4,055,000	9,446,000	13,501,000
3. Allocation of major replacements:			
(a) Specific costs	$27,000	$641,000	$668,000
(b) Allocated joint use costs	$86,000	$86,000	$172,000
(c) Percent joint use costs	50	50	100
(d) Total allocation	$113,000	$727,000	$840,000
(e) Percent total allocation	13.452	86.548	100
4. Allocation of operation and maintenance:			
(a) Specific costs	$133,000	$980,000	$1,113,000
(b) Allocated joint use costs	$416,000	$416,000	$832,000
(c) Percent joint use costs	50	50	100
(d) Total allocation	$549,000	$1,396,000	$1,945,000
(e) Percent total allocation	28.226	71.774	100
5. Allocation of interest and amortization:			
(a) Specific costs	$807,000	$4,737,000	$5,544,000
(b) Allocated joint use costs	$2,586,000	$2,586,000	$5,172,000
(c) Percent joint use costs	50	50	100
(d) Total allocation	$3,393,000	$7,323,000	$10,716,000
(e) Percent total allocation	31.663	68.337	100
6. Allocation of investment:			
(a) Specific costs	$22,887,000	$134,351,800	$157,238,800
(b) Allocated joint use costs	$73,343,000	$73,343,000	$146,686,000
(c) Percent joint use costs	50	50	100
(d) Total allocation	$96,230,000	$207,694,800	$303,924,800
(e) Percent total allocation	31.662	68.338	100
7. Allocation of interest during construction:			
(a) Specific costs	$1,846,400	$6,633,600	$8,480,000
(b) Allocated joint use costs	$4,583,900	$6,037,100	$10,621,000
(c) Percent joint use costs	43.159	56.841	100
(d) Total allocation	$6,430,300	$12,670,700	$19,101,000
(e) Percent total allocation	33.665	66.335	100
8. Allocation of construction costs:			
(a) Specific costs	$21,040,600	$127,718,200	$148,758,800
(b) Allocated joint use costs	$68,759,100	$67,305,900	$136,065,000
(c) Percent joint use costs	50.534	49.466	100
(d) Total allocation	$89,799,700	$195,024,100	$284,823,800
(e) Percent total allocation	31.528	68.472	100
9. Ratio of benefits to allocated costs:			
(a) Total allocation	0.27 to 1	1.83 to 1	1.42 to 1

[1] Specific, total construction and operation and maintenance and major replacement costs from computations for separable costs—remaining benefits method.
[2] Exclusive of recreation costs and benefits and irrigation benefits.

The Dalles Project—Columbia River Basin

Study No. 1.—*Summary of results of applying various methods of cost allocation to the Dalles project, Columbia River, Oreg. and Wash.*

Study	Item	Navigation	Power	Total
1-A	Separable costs-remaining benefits method:			
	(1) Allocation of conventional joint construction costs	$8,224,000	$104,751,000	$112,975,000
	(2) Additional specific construction costs	14,197,000	142,828,000	157,025,000
	(3) Allocated construction cost	22,421,000	247,579,000	270,000,000
	(4) Interest during construction	849,000	17,977,000	18,826,000
	(5) Allocated investment	23,270,000	265,556,000	288,826,000
1-B	Alternative justifiable expenditure method:			
	(1) Allocation of conventional joint construction costs	8,162,000	104,813,000	112,975,000
	(2) Additional specific construction costs	14,197,000	142,828,000	157,025,000
	(3) Allocated construction cost	22,359,000	247,641,000	270,000,000
	(4) Interest during construction	849,000	17,977,000	18,826,000
	(5) Allocated investment	23,208,000	265,618,000	288,826,000
1-C	Priority of use method:			
	(1) Allocation of conventional joint construction cost	8,506,000	104,469,000	112,975,000
	(2) Additional specific construction costs	14,197,000	142,828,000	157,025,000
	(3) Allocated construction cost	22,703,000	247,297,000	270,000,000
	(4) Interest during construction	1,185,000	17,641,000	18,826,000
	(5) Allocated investment	23,888,000	264,938,000	288,826,000
1-D	Use of facilities method:			
	(1) Allocation of conventional joint construction costs	56,487,000	56,488,000	112,975,000
	(2) Additional specific construction costs	14,197,000	142,828,000	157,025,000
	(3) Allocated construction costs	70,684,000	199,316,000	270,000,000
	(4) Interest during construction	5,060,000	13,766,000	18,826,000
	(5) Allocated investment	75,744,000	213,082,000	288,826,000
	Average of studies 1-A, B, and C:			
	(1) Allocated conventional joint construction cost	8,297,000	104,678,000	112,975,000
	(2) Additional specific construction cost	14,197,000	142,828,000	157,025,000
	(3) Allocated construction costs	22,494,000	247,506,000	270,000,000
	(4) Interest during construction	961,000	17,865,000	18,826,000
	(5) Allocated investment	23,455,000	265,371,000	288,826,000

THE DALLES PROJECT—COLUMBIA RIVER BASIN—Continued

STUDY NO. 1–A.—*Allocation by the separable costs-remaining benefit method*

Item	Navigation	Power	Total
1. Average annual benefits	$903, 800	$23, 167, 000	$24, 160, 800
2. Single purpose alternate	(105, 000, 000)	(255, 500, 000)	
(1) Interest and amortization: [1]			
(a) Construction cost	3, 702, 300	9, 008, 900	
(b) Interest during construction	137, 400	663, 400	
(2) Operation, maintenance, and replacement	696, 500	2, 112, 800	
(3) Taxes foregone		2, 426, 800	
(4) Total annual cost	4, 536, 200	14, 211, 900	
3. Justifiable annual cost	993, 800	14, 211, 900	15, 205, 700
4. Separable costs	(14, 500, 000)	(165, 000, 000)	
(1) Interest and amortization: [1]			
(a) Construction cost	511, 300	5, 817, 900	
(b) Interest during construction	400	526, 400	
(2) Operation, maintenance, and replacement	78, 300	1, 494, 600	
(3) Taxes foregone		2, 426, 800	
(4) Total	590, 000	10, 265, 700	10, 855, 700
5. Remaining benefits	403, 800	3, 946, 200	4, 350, 000
6. Percentage distribution	9. 28	90. 72	100. 00
7. Remaining joint costs to be allocated			($90, 500, 000)
(1) Interest and amortization: [1]			
(a) Construction cost	$206, 100	$2, 894, 900	$3, 191, 000
(b) Interest during construction	12, 700	124, 300	137, 000
(2) Operation, maintenance, and replacement	57, 400	560, 800	618, 200
(3) Total	366, 200	3, 580, 000	3, 946, 200
8. Total annual costs	956, 200	13, 845, 700	14, 801, 900
9. Benefit-to-cost ratio	1.04 to 1.00	1.67 to 1.00	1.63 to 1.00
10. Allocation of investment cost:			
(1) Operation, maintenance, and replacement:			
(a) Separable	$78, 300	$1, 494, 600	$1, 572, 900
(b) Allocated joint	57, 400	560, 800	618, 200
(2) Taxes foregone		2, 426, 800	2, 426, 800
(3) Allocated investment cost	820, 500	9, 363, 500	10, 184, 000
11. Allocated investment	23, 270, 000	265, 556, 000	288, 826, 000
(1) Specific investment	14, 695, 000	152, 031, 000	166, 726, 000
(2) Allocated conventional joint investment	8, 575, 000	113, 525, 000	122, 100, 000
12. Interest during construction:			
(1) Specific	498, 000	9, 203, 000	9, 701, 000
(2) Joint	351, 000	8, 774, 000	9, 125, 000
(3) Total	849, 000	17, 977, 000	18, 826, 000
13. Allocated construction costs	22, 421, 000	247, 579, 000	270, 000, 000
(1) Specific	14, 197, 000	142, 828, 000	157, 025, 000
(2) Conventional joint cost	8, 224, 000	104, 751, 000	112, 975, 000

[1] Interest at 2½ percent, amortization in 50 years.

THE DALLES PROJECT—COLUMBIA RIVER BASIN—Continued

STUDY NO. 1-B.—*Allocation by the alternative justifiable expenditure method*

Item	Navigation	Power	Total
1. Average annual benefit	$993,800	$23,167,000	$24,160,800
2. Single-purpose alternate	(105,000,000)	(255,500,000)	
(1) Interest and amortization: [1]			
(a) Construction cost	3,702,300	9,008,900	
(b) Interest during construction	137,400	663,400	
(2) Operation, maintenance, and replacement	696,500	2,112,800	
(3) Taxes foregone		2,426,800	
(4) Total annual cost	4,536,200	14,211,900	
3. Justifiable annual cost	993,800	14,211,900	$15,205,700
4. Less specific costs	(14,197,000)	(142,828,000)	
(1) Interest and amortization: [1]			
(a) Construction cost	500,600	5,036,100	
(b) Interest during construction	17,600	324,500	
(2) Operation, maintenance, and replacements	94,000	1,333,200	
(3) Taxes foregone		2,426,800	
(4) Total	612,200	9,120,600	9,732,800
5. Remaining justifiable alternative annual cost	381,600	5,091,300	5,472,900
6. Percentage distribution	6.97	93.03	100.00
7. Total joint costs to be allocated	($7,877,000)	($105,098,000)	($112,975,000)
(1) Interest and amortization: [1]			
(a) Construction cost	$277,700	$3,705,800	$3,983,500
(b) Interest during construction	22,400	299,300	321,700
(2) Operation, maintenance, and replacement	53,300	710,600	763,900
(3) Total	353,400	4,715,700	5,069,100
8. Total allocated annual cost 4 (4) plus 7 (3)	965,600	13,836,300	14,801,900
Benefit-to-cost ratio	1.03 to 1.00	1.67 to 1.00	1.63 to 1.00
9. Allocation of investment cost:			
(1) Operation, maintenance and replacement costs:			
(a) Specific	$94,000	$1,333,200	$1,427,200
(b) Allocated joint	53,300	710,600	763,900
(2) Taxes foregone		2,426,800	2,426,800
(3) Allocated investment cost	818,300	9,365,700	10,184,000
10. Allocated investment	23,208,000	265,618,000	288,826,000
(1) Specific investment	14,695,000	152,031,000	166,726,000
(2) Allocated joint investment	8,513,000	113,587,000	122,100,000
11. Interest during construction:			
(1) Specific	498,000	9,203,000	9,701,000
(2) Joint	351,000	8,774,000	9,125,000
(3) Total	849,000	17,977,000	18,826,000
12. Allocated construction cost	22,359,000	247,641,000	270,000,000
(1) Specific	14,197,000	142,828,000	157,025,000
(2) Joint	8,162,000	104,813,000	112,975,000

[1] Interest at 2½ percent, amortization in 50 years.

THE DALLES PROJECT—COLUMBIA RIVER BASIN—Continued

STUDY NO. 1–C.—*Allocation by the priority of use method*

Item	Navigation	Power	Total
1. Annual benefits and costs:			
(*a*) Annual benefits	$993,800	$23,167,000	$24,160,800
(*b*) Alternate costs, annual	4,536,200	14,211,900	18,748,100
(*c*) Justifiable costs	993,800	14,211,900	15,205,700
(*d*) Less specific costs	612,200	9,120,600	9,732,800
(*e*) Remaining justifiable costs	381,600	5,091,300	5,472,900
(*f*) Allocation of joint reservoir costs	381,600	4,687,500	5,069,100
(*g*) Total allocation	993,800	13,808,100	14,801,900
(*h*) Taxes foregone	0	2,426,800	2,426,800
(*i*) Allocated project costs	993,800	11,381,300	12,375,100
2. Operation, maintenance and replacements:			
(*a*) Specific	94,000	1,333,200	1,427,200
(*b*) Joint	57,500	706,400	763,900
(*c*) Total	151,500	2,039,600	2,191,100
(*d*) Investment costs	842,300	9,341,700	10,184,000
3. Investment costs:			
(*a*) Total	23,888,000	264,938,000	288,826,000
(*b*) Specific	14,695,000	152,031,000	166,726,000
(*c*) Joint	9,193,000	112,907,000	122,100,000
4. Construction costs:			
(*a*) Interest during construction	1,185,000	17,641,000	18,826,000
(*b*) Construction cost:			
1. Total	22,703,000	247,297,000	270,000,000
2. Specific	14,197,000	142,828,000	157,025,000
3. Joint	8,506,000	104,469,000	112,975,000

STUDY NO. 1–D.—*Allocation by the use of facilities method*

Item	Navigation	Power	Total
1. Average annual benefits	$993,800	$23,167,000	$24,160,800
2. Storage used (acre-feet)	330,000	330,000	330,000
3. Allocation of construction costs:			
(1) Specific costs	$14,197,000	$142,828,000	$157,025,000
(2) Allocated joint	56,487,000	56,488,000	112,975,000
(3) Total	70,684,000	199,316,000	270,000,000
4. Allocation of investment:			
(1) Interest during construction:			
(*a*) Specific	498,000	9,203,000	9,701,000
(*b*) Joint	4,562,000	4,563,000	9,125,000
(2) Allocated investment	75,744,000	213,082,000	288,826,000
5. Allocation of annual costs:			
(1) Interest and amortization [1]	2,670,700	7,513,300	10,184,000
(2) Operation, maintenance, and replacements:			
(*a*) Specific	94,000	1,333,200	1,427,200
(*b*) Allocated joint	381,900	382,000	763,900
(3) Taxes foregone		2,426,800	2,426,800
(4) Total	3,146,600	11,655,300	14,801,900
6. Benefit-to-cost ratio	0.32 to 1.00	1.99 to 1.00	1.63 to 1.00

[1] Interest at 2½ percent, amortization in 50 years.

Bonneville Project—Columbia River Basin

Study No. 2.—*Summary of results of applying various methods of cost allocation to Bonneville project, Columbia River, Oreg. and Wash.*

Study	Item	Navigation	Power	Total
2-A	Separable costs-remaining benefits method:			
	(1) Allocation of conventional joint construction costs	$18,944,000	$19,850,000	$38,749,000
	(2) Additional specific construction costs	6,232,000	37,074,000	43,306,000
	(3) Allocated construction cost	25,176,000	56,879,000	82,055,000
	(4) Interest during construction	1,266,000	2,290,000	3,556,000
	(5) Allocated investment	26,442,000	59,169,000	85,611,000
2-B	Alternative justifiable expenditure method:			
	(1) Allocation of conventional joint construction costs	18,700,000	20,049,000	38,749,000
	(2) Additional specific construction costs	6,232,000	37,074,000	43,306,000
	(3) Allocated construction cost	24,932,000	57,123,000	82,055,000
	(4) Interest during construction	1,266,000	2,290,000	3,556,000
	(5) Allocated investment	26,198,000	59,413,000	85,611,000
2-C	Priority of use method:			
	(1) Allocation of conventional joint construction cost.	35,189,000	3,560,000	38,749,000
	(2) Additional specific construction costs	6,232,000	37,074,000	43,306,000
	(3) Allocated construction cost	41,421,000	40,634,000	82,055,000
	(4) Interest during construction	2,106,000	1,450,000	3,556,000
	(5) Allocated investment	43,527,000	42,084,000	85,611,000
2-D	Use of facilities method:			
	(1) Allocation of conventional joint construction costs	19,374,000	19,375,000	38,749,000
	(2) Additional specific construction costs	6,232,000	37,074,000	43,306,000
	(3) Allocated construction costs	25,606,000	56,449,000	82,055,000
	(4) Interest during construction	1,295,000	2,261,000	3,556,000
	(5) Allocated investment	26,901,000	58,710,000	85,611,000
	Average of studies 2-A, B, and C:			
	(1) Allocated conventional joint construction cost	24,278,000	14,471,000	38,749,000
	(2) Additional specific construction costs	6,232,000	37,074,000	43,306,000
	(3) Allocated construction costs	30,510,000	51,545,000	82,055,000
	(4) Interest during construction	1,546,000	2,010,000	3,556,000
	(5) Allocated investment	32,056,000	53,555,000	85,611,000

BONNEVILLE PROJECT—COLUMBIA RIVER BASIN—Continued

STUDY NO. 2–A.—*Allocation by the separable costs-remaining benefits method*

Item	Navigation	Power	Total
1. Average annual benefits	$1,870,000	$14,199,000	$16,069,000
2. Single-purpose alternate	(43,098,000)	(73,958,000)	
(1) Interest and amortization: [1]			
(a) Construction cost	1,519,500	2,607,600	
(b) Interest during construction	76,300	114,300	
(2) Operation, maintenance, and replacement	341,500	848,500	
(3) Taxes foregone		1,139,000	
(4) Total annual cost	1,937,300	4,709,400	
3. Justifiable annual cost	1,870,000	4,709,400	6,579,400
4. Separable costs	(8,097,000)	(38,957,000)	
(1) Interest and amortization: [1]			
(a) Construction cost	285,500	1,373,600	
(b) Interest during construction	11,100	49,100	
(2) Operation, maintenance, and replacement	36,700	543,700	
(3) Taxes foregone		1,139,000	
(4) Total	333,300	3,105,400	3,438,700
5. Remaining benefits	1,536,700	1,604,000	3,140,700
6. Percentage distribution	48.93	51.07	100.00
7. Remaining joint costs to be allocated			($35,001,000)
(1) Interest and amortization: [1]			
(a) Construction	$603,800	$630,200	$1,234,000
(b) Interest during construction	31,900	33,300	65,200
(2) Operation, maintenance, and replacement	149,100	155,700	304,800
(3) Total	784,800	819,200	1,604,000
8. Total annual costs	1,118,100	3,924,600	5,042,700
9. Benefit-to-cost ratio	1.67 to 1.00	3.62 to 1.00	3.19 to 1.00
10. Allocation of investment cost:			
(1) Operation, maintenance, and replacement:			
(a) Separable	$36,700	$543,700	$580,400
(b) Allocated joint	149,100	155,700	304,800
(2) Taxes foregone		1,139,000	1,139,000
(3) Allocated investment cost	932,300	2,086,200	3,018,500
11. Allocated investment	26,442,000	59,169,000	85,611,000
(1) Specific investment	6,534,000	38,341,000	44,875,000
(2) Allocated conventional joint investment	19,908,000	20,828,000	40,736,000
12. Interest during construction:			
(1) Specific	302,000	1,267,000	1,569,000
(2) Joint	964,000	1,023,000	1,987,000
(3) Total	1,266,000	2,290,000	3,556,000
13. Allocated construction cost	25,176,000	56,879,000	82,055,000
(1) Specific	6,232,000	37,074,000	43,306,000
(2) Conventional joint cost	18,944,000	19,805,000	38,749,000

[1] Interest at 2½ percent, amortization in 50 years.

BONNEVILLE PROJECT—COLUMBIA RIVER BASIN—Continued

STUDY NO. 2-B.—*Allocation by the alternative justifiable expenditure method*

Item	Navigation	Power	Total
1. Average annual benefit	$1, 870, 000	$14, 199, 000	$16, 069, 000
2. Single-purpose alternate	(43, 098, 000)	(73, 958, 000)	
(1) Interest and amortization: [1]			
(a) Construction cost	1, 519, 500	2, 607, 600	
(b) Interest during construction	76, 300	114, 300	
(2) Operation, maintenance, and replacement	341, 500	848, 500	
(3) Taxes foregone		1, 139, 000	
(4) Total annual cost	1, 937, 300	4, 709, 400	
3. Justifiable annual cost	1, 870, 000	4, 709, 400	6, 579, 400
4. Less specific costs	(6, 232, 000)	(37, 074, 000)	
(1) Interest and amortization: [1]			
(a) Construction cost	219, 800	1, 307, 100	
(b) Interest during construction	10, 600	44, 700	
(2) Operation, maintenance, and replacements	55, 800	521, 600	
(3) Taxes foregone		1, 139, 000	
(4) Total	286, 200	3, 012, 400	3, 298, 600
5. Remaining justifiable alternative annual cost	1, 583, 800	1, 697, 000	3, 280, 800
6. Percentage distribution	48. 27	51. 73	100. 00
7. Total joint costs to be allocated			($38, 749, 000)
(1) Interest and amortization: [1]			
(a) Construction cost	$659, 500	$706, 700	$1, 366, 200
(b) Interest during construction	33, 800	36, 300	70, 100
(2) Operation, maintenance, and replacement	148, 600	159, 200	307, 800
(3) Total	841, 900	902, 200	1, 744, 100
8. Total allocated annual cost 4 (4)+7 (3)	1, 128, 100	3, 914, 600	5, 042, 700
Benefit-to-cost ratio	1. 66 to 1. 00	3. 63 to 1. 00	3. 19 to 1. 00
9. Allocation of investment cost:			
(1) Operation, maintenance, and replacement costs:			
(a) Specific	$55, 800	$521, 600	$577, 400
(b) Allocated joint	148, 600	159, 200	307, 800
(2) Taxes foregone		1, 139, 000	1, 139, 000
(3) Allocated investment cost	923, 700	2, 094, 800	3, 018, 500
10. Allocated investment	26, 198, 000	59, 413, 000	85, 611, 000
(1) Specific investment	6, 534, 000	38, 341, 000	44, 875, 000
(2) Allocated joint investment	19, 664, 000	21, 072, 000	40, 736, 000
11. Interest during construction:			
(1) Specific	302, 000	1, 267, 000	1, 569, 000
(2) Joint	964, 000	1, 023, 000	1, 987, 000
(3) Total	1, 266, 000	2, 290, 000	3, 556, 000
12. Allocated construction cost	24. 932, 000	57, 123, 000	82, 055, 000
(1) Specific	6, 232, 000	37, 074, 000	43, 306, 000
(2) Joint	18, 700, 000	20, 049, 000	38, 749, 000

[1] Interest at 2½ percent, amortization in 50 years.

BONNEVILLE PROJECT—COLUMBIA RIVER BASIN—Continued

STUDY NO. 2-C.—*Allocation by the priority of use method*

Item	Navigation	Power	Total
1. Annual benefits and costs:			
(a) Annual benefits	$1,870,000	$14,199,000	$16,069,000
(b) Alternate costs, annual	1,937,700	4,709,400	6,647,100
(c) Justifiable costs	1,870,000	4,709,400	6,579,400
(d) Less specific costs	286,200	3,012,400	3,298,600
(e) Remaining justifiable costs	1,583,800	1,697,000	3,280,800
(f) Allocation of joint reservoir costs	1,583,800	160,300	1,744,100
(g) Total allocation	1,870,000	3,172,700	5,042,700
(h) Taxes foregone	0	1,139,000	1,139,000
(i) Allocated projected costs	1,870,000	2,033,700	3,903,700
2. Operation, maintenance and replacement:			
(a) Specific	55,800	521,600	577,400
(b) Joint	279,500	28,300	307,800
(c) Total	335,300	549,900	885,200
(d) Investment costs	1,534,700	1,483,800	3,018,500
3. Investment costs:			
(a) Total	43,527,000	42,084,000	85,611,000
(b) Specific	6,534,000	38,341,000	44,875,000
(c) Joint	36,993,000	3,743,000	40,736,000
4. Construction costs:			
(a) Interest during construction	2,106,000	1,450,000	3,556,000
(b) Construction cost:			
(1) Total	41,421,000	40,634,000	82,055,000
(2) Specific	6,232,000	37,074,000	43,306,000
(3) Joint	35,189,000	3,560,000	38,749,000

STUDY NO. 2-D.—*Allocation by the use of facilities method*

Item	Navigation	Power	Total
1. Average annual benefits	$1,870,000	$14,199,000	$16,069,000
2. Storage used (acre-feet)	537,000	537,000	537,000
3. Allocation of construction costs:			
(1) Specific costs	$6,232,000	$37,074,000	$43,306,000
(2) Allocated joint	19,374,000	19,375,000	38,749,000
(3) Total	25,606,000	56,449,000	82,055,000
4. Allocation of investment:			
(1) Interest during construction:			
(a) Specific	302,000	1,267,000	1,569,000
(b) Joint	993,000	994,000	1,987,000
(2) Allocated investment	26,901,000	58,710,000	85,611,000
5. Allocation of annual costs:			
(1) Interest and amortization [1]	948,500	2,070,000	3,018,500
(2) Operation, maintenance, and replacements:			
(a) Specific	55,800	521,600	577,400
(b) Allocated joint	153,900	153,900	307,800
(3) Taxes foregone		1,139,000	1,139,000
(4) Total	1,158,200	3,884,500	5,042,700
6. Benefit-to-cost ratio	1.61 to 1.00	3.66 to 1.00	3.19 to 1.00

[1] Interest at 2½ percent, amortization in 50 years.

Russian River Project

COST ALLOCATION STUDY, RUSSIAN RIVER RESERVOIR (COYOTE VALLEY), CALIF.

(Prepared in the office of the district engineer, San Francisco District, Corps of Engineers, U. S. Army, October 2, 1956)

1. *Purpose and authority.*—The purpose of the cost allocation study is to determine the effect of various cost allocation methods on the subject project. The study was directed to be made by the Chief of Engineers in letter dated August 27, 1956, subject: Allocation Analysis for Senate Committees on Interior and Insular Affairs and Public Works, ENGWD.

2. *Project description.*—The subject project was authorized in the 1950 Flood Control Act as the initial stage of a comprehensive plan of improvement of the Russian River for flood control, water conservation, and related purposes. The act provides that local interests shall contribute the sum of $5,598,000 in full repayment of the conservation benefits prior to start of construction and that such contribution of $5,598,000 shall be transferred to the Secretary of the Army for application to the cost of construction of the project. Local interests (Sonoma County, Calif.) made the required cash contribution to the Secretary of Interior who in turn transferred the $5,598,000 to the Secretary of the Army on March 6, 1956, in accordance with the authorizing act. The dam is presently under construction.

3. The project provides for construction of a multiple-purpose reservoir for flood control and water conservation on the East Fork of the Russian River at Coyote Valley, and channel improvement works along critical reaches of the Russian River. The water stored in the reservoir for conservation purposes will be used to supplement urban and agricultural water supplies, and to augment summer low water flows. Hydropower was not included as a project feature at the time of the project authorization because it was found to be not economically feasible. Further detailed analyses made at design stage indicated that the relatively small amount of hydropower which could be developed would still not be economically justified. The Federal Power Commission has concurred in these findings. Power facilities have not been included, therefore, in the dam and reservoir features which are presently under construction.

4. *Basis for cost-allocation study.*—Since the channel works are a distinct and separate part of the project and have no bearing on reservoir cost allocations, they have not been included in the study. Also, hydro power has been excluded since the project does not contain this feature. The cost estimate for the reservoir ($15,830,000) is based on the latest approved estimate of cost which reflects work presently under contract. Allocations were made on the basis of the two principal project purposes, namely, flood control and water conservation.

5. *Summary of cost allocation studies.*—In accordance with instructions in paragraph 2 of letter referred to in paragraph 1 above, studies were made of use of facilities method as well as separable costs—remaining benefits, alternative justifiable expenditure, and priority of use methods. For this latter method, flood control was given first priority, with water conservation being allocated the incremental cost.

The summaries and the individual methods are shown in the inclosed tabulations. All except the priority of use method give results which are in relatively close agreement.

6. *Basis for payment of $5,598,000 by local interests.*—The cash contribution of $5,598,000 made by Sonoma County represents the local share of the total reservoir cost allocated to water conservation as derived in the survey report. Of the total estimated reservoir cost of $16,250,000, the sum of $9,330,000 was allocated to water conservation. The procedure used for arriving at this allocation is similar to the alternative justifiable expenditure method.

7. Because of the general nature of evaluated and unevaluated benefits which were expected to result from the release of stored water from the reservoir for augmenting streamflow and for supplementing water supplies for various purposes, it was considered that there was a Federal interest to the extent of 40 percent of the cost allocated to water conservation. The remaining 60 percent of the $9,330,000 or $5,598,000, was allocated to local interests as their full repayment of costs for the water conservation feature of the project. As indicated above, local interests have complied with this requirement and have contributed the $5,598,000.

(Tabulations: 1. Summary; 2. Study No. 1; 3. Study No. 2· 4. Study No. 3; 5. Study No. 4.)

Summary of results of applying various methods of cost allocation

Item	Flood control	Water conservation	Total
1. Separable costs-remaining benefits:			
(1) Allocation of joint reservoir costs:			
(a) Separable cost	$4,830,000	$5,530,000	$10,360,000
(b) Allocation of remaining cost	2,735,000	2,735,000	5,470,000
Total reservoir allocation	7,565,000	8,265,000	15,830,000
2. Alternative justifiable expenditure:			
(1) Allocation of joint reservoir costs	7,710,000	8,120,000	15,830,000
Total reservoir allocation	7,710,000	8,120,000	15,830,000
3. Priority of use:			
(1) Allocation of joint reservoir costs	10,300,000	5,530,000	15,830,000
Total reservoir allocation	10,300,000	5,530,000	15,830,000
4. Use of facilities:			
(1) Allocation of joint reservoir costs:			
(a) Separable cost	4,830,000	5,530,000	10,360,000
(b) Allocation of remaining cost	2,265,000	3,205,000	5,470,000
Total reservoir allocation	7,095,000	8,735,000	15,830,000
5. Average of 1, 2, and 4	7,457,000	8,373,000	15,830,000

Russian River Project—Continued

Study No. 1.—*Separable costs-remaining benefits allocation method*

Item	Flood control	Water conservation	Total
1. Annual benefits	$428,000	$1,144,000	$1,572,000
2. Single-purpose alternative	(10,300,000)	(11,000,000)	
(1) Construction cost [1]	363,900	389,000	
(2) Interest during construction	13,600	14,500	
(3) Operation, maintenance and replacement	41,000	36,000	
(a) Total	418,500	439,500	
3. Justifiable investment	418,500	439,500	
4. Separable costs, dam, and reservoir	(4,830,000)	(5,530,000)	(10,360,000)
(1) Construction cost	170,100	195,200	
(2) Interest during construction	6,400	7,300	
(3) Operation, maintenance and replacement	39,000	34,000	
(a) Total	215,500	236,500	
5. Remaining benefits	203,000	203,000	406,000
6. Percent distribution	50.0	50.0	100.0
7. Remaining costs to be allocated	($2,735,000)	($2,735,000)	($5,470,000)
(1) Construction cost	$96,900	$96,900	$193,800
(2) Interest during construction	3,600	3,600	7,200
(3) Operation, maintenance, and replacement	1,000	1,000	2,000
(a) Total	101,500	101,500	203,000
8. Total annual costs (lines 4 (a)+7 (a))	317,000	338,000	655,000
Benefit-cost ratio	1.35	3.39	2.41
9. Final allocation (lines 4+7)	$7,565,000	$8,265,000	$15,830,000

[1] Based on 2½ percent interest rate and 50-year economic life.

Study No. 2.—*Alternative justifiable expenditure method*

Item	Flood control	Water conservation	Total
1. Annual benefits	$428,000	$1,144,000	$1,572,000
2. Single-purpose alternative (annual)	[1] 418,500	[1] 439,500	
3. Justifiable investment	418,500	439,500	
4. Less specific costs [2]	0	0	
5. Remaining alternative	418,500	439,500	858,000
6. Percent distribution	48.6	51.4	100.0
7. Total joint costs to be allocated	($7,710,000)	($8,120,000)	($15,830,000)
(1) Constructions cost	272,300	286,700	559,000
(2) Interest during construction	10,300	10,700	21,000
(3) Operation, maintenance, and replacement	36,400	38,600	75,000
8. Total annual costs	319,000	336,000	655,000
Benefit-cost ratio	1.34	3.41	2.41
9. Final allocation	$7,710,000	$8,120,000	$15,830,000

[1] From line 2 (a) of study No. 1.
[2] There are no specific costs since all features of project serve dual purposes.

RUSSIAN RIVER PROJECT—Continued

STUDY NO. 3.—*Priority of use method*

Item	Flood control	Water conservation	Total
1. Remaining alternative [1]	$10,300,000	$11,000,000	
2. Allocation of joint reservoir costs [2]	10,300,000	0	$10,300,000
3. Specific reservoir costs [3]	0	5,530,000	5,530,000
4. Final allocation	10,300,000	5,530,000	15,830,000

[1] From line 2, study No. 1.
[2] Based on flood control as first priority.
[3] Taken as incremental cost for providing 70,000 acre-feet storage in the reservoir for water conservation.

STUDY NO. 4.—*Use of facilities method*

Item	Flood control	Water conservation	Total
1. Separable cost (1st cost) [1]	$4,830,000	$5,530,000	$10,360,000
2. Separable cost (annual) [2]	$215,500	$236,500	$452,000
3. Allocation of joint costs in percent [3]	41.4	58.6	100.0
4. Allocation of joint costs	($2,265,000)	($3,205,000)	($5,470,000)
(1) Construction cost	80,200	113,600	193,800
(2) Interest during construction	3,000	4,200	7,200
(3) Operation, maintenance, and replacement	800	1,200	2,000
(a) Total	84,000	119,000	203,000
5. Total annual costs (lines 2 plus 4 (a))	299,500	355,500	655,000
Benefit-cost ratio	1.42	3.22	2.41
6. Final allocation (lines 1 plus 4)	$7,095,000	$8,735,000	$15,830,000

[1] From line 4, study No. 1.
[2] From line 4 (a), study No. 1.
[3] Based on ratio of storage required for each purpose plus silt reservation:

Flood control equals 48,000 plus 4,500, or 41.4 percent	52,500
Water conservation equals 70,000 plus 4,500, or 58.6 percent	74,500
Total	127,000

DEPARTMENT OF THE INTERIOR

DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SECRETARY,
Washington, D. C., January 18, 1957.

Hon. JAMES E. MURRAY,
Chairman, Committee on Interior and Insular Affairs,
United States Senate, Washington, D. C.

MY DEAR SENATOR MURRAY: Attached are 10 copies each of cost allocations by various methods for the Boulder Canyon, Central Valley, Columbia Basin, and Missouri River Basin projects of the Bureau of Reclamation which you requested in connection with Senate Resolution 281 (84th Cong.), in your letter of August 7, 1956. Also, there are attached four copies each of similar cost allocation data for the Colorado-Big Thompson, Colorado River storage, Fryingpan-Arkansas, and Weber Basin projects of the Bureau of Reclamation. Six copies of each of these items were forwarded to you with our letter of November 20, 1956. However, the summary sheet for the Colorado River storage project, as previously forwarded, has been revised because it did not include an allocation based on the average of the alternative justifiable expenditure method and the priority-of-use method. There are attached six copies of a revised summary sheet for the Colorado River storage project which does include this average method.

This completes our submission of data on cost allocations which you requested in your letter of August 7.

Sincerely yours,

FRED G. AANDAHL,
Assistant Secretary of the Interior.

(Attachments.)

Colorado-Big Thompson Project

In the case of irrigation, the classification of project features follows the pattern set in Senate Document 80, 75th Congress, and results in figures different from those obtained should the features be classified strictly from a functional standpoint. For this reason, the separable costs for irrigation as used in the separable costs-remaining benefits are actually less than specific costs as used in the alternative justifiable expenditure and priority of use methods. In the case of power separable costs are greater than the specific costs.

Study No. 1.—*Summary of results of applying various methods of cost allocation to the Colorado-Big Thompson project, Colorado*

[In thousands of dollars]

	Power	Irrigation	Allocated to other project [1]	Total project cost
1. Separable costs—remaining benefits:				
(1) Allocation of joint costs [2]	25,623	10,644		36,267
(2) Add specific costs [2]	40,988	80,389		121,377
(3) Total construction costs	66,611	91,033	1,355	158,999
(4) Interest during construction	2,205			2,205
(5) Total allocation	68,816	91,033	1,355	161,204
2. Alternative justifiable expenditure:				
(1) Allocation of joint costs [2]	20,861	15,406		36,267
(2) Add specific costs [2]	40,988	80,389		121,377
(3) Total construction costs	61,849	95,795	1,355	158,999
(4) Interest during construction	2,205			2,205
(5) Total allocation	64,054	95,795	1,355	161,204
3. Priority of use:				
(1) Allocation of joint costs [2]	15,994	20,273		36,267
(2) Add specific costs [2]	40,988	80,389		121,377
(3) Total construction costs	56,982	100,662	1,355	158,999
(4) Interest during construction	2,205			2,205
(5) Total allocation	59,187	100,662	1,355	161,204
4. Average of alternative justifiable expenditure and priority of use:				
(1) Allocation of joint costs [2]	18,427	17,840		36,267
(2) Add specific costs [2]	40,988	80,389		121,377
(3) Total construction costs	59,415	98,229	1,355	158,999
(4) Interest during construction	2,205			2,205
(5) Total allocation	61,620	98,229	1,355	161,204

[1] This cost represents investment in Salida-Gunnison transmission line and associated substations and is assigned to Fryingpan-Arkansas project for repayment.

[2] Designation of specific and joint use features are based upon provisions of S. Doc. 80, 75th Cong., 1st sess. which classed project features according to primary use rather than strictly by single purpose or joint use.

COLORADO-BIG THOMPSON PROJECT—Continued

STUDY NO. 2.—*Allocation of costs by separable costs-remaining-benefits method, Colorado-Big Thompson project, Colorado*

[In thousands of dollars]

	Power	Irrigation	Total	Allocated to other project	Total project costs
Annual benefits	6,238	3,714	9,952		
Annual operation, maintenance, and replacement	1,847	228	2,075		
Annual net benefits	4,391	3,486	7,877		
Capitalized benefits	160,778	127,641	288,419		
Alternative costs	112,979	100,662	213,641		
Limited benefits	112,979	100,662	213,641		
Separable costs [1]	101,520	40,330	141,850		
Taxes included	(44,538)		(44,538)		
Remaining benefits	11,459	60,332	71,791		
Percent distribution	15.96	84.04	100.00		
Joint costs	9,629	50,703	60,332		
Separable costs [1]	56,982	40,330	97,312		
Allocation of construction costs	66,611	91,033	157,644	1,355	158,999
Interest during construction	2,205		2,205		
Allocation	68,816	91,033	159,849	1,355	161,204

[1] Separable costs were determined on the basis of costs of single-purpose projects without regard to S. Doc. 80, 75th Cong.

STUDY NO. 3.—*Allocation of costs by alternative justifiable expenditure method Colorado-Big Thompson project, Colorado*

[In thousands of dollars]

	Power	Irrigation	Total	Allocated to other project	Total project costs
Annual benefits	6,238	3,714	9,952		
Annual operation, maintenance, and replacement	1,847	228	2,075		
Annual net benefits	4,391	3,486	7,877		
Justifiable investment	160,778	127,641	288,419		
Alternative costs	112,979	100,662	213,641		
Alternative justifiable expenditure	112,979	100,662	213,641		
Specific costs	85,526	80,389	165,915		
Taxes included	(44,538)		(44,538)		
Remainder	27,453	20,273	47,726		
Percent distribution	57.52	42.48	100.00		
Joint costs	20,861	15,406	36,267		
Specific costs	40,988	80,389	121,377		
Allocation of construction costs	61,849	95,795	157,644	1,355	158,999
Interest during construction	2,205		2,205		
Allocation	64,054	95,795	159,849	1,355	161,204

COLORADO-BIG THOMPSON PROJECT—Continued

STUDY NO. 4.—*Allocation of costs by priority of use method, Colorado-Big Thompson project, Colorado*

[In thousands of dollars]

	Power	Irrigation	Total	Allocated to other project	Total project cost
Justifiable investment	160,778	127,641	288,419		
Alternative costs	112,979	100,662	213,641		
Alternative justifiable expenditure	112,979	100,662	213,641		
Joint costs	15,994	20,273	33,267		
Specific costs	40,988	80,389	121,377		
Allocation of construction costs	56,982	100,662	157,644	1,355	158,999
Interest during construction	2,205		2,205		
Allocation	59,187	100,662	159,849	1,355	161,204

Colorado River Storage Project

TABLE 2–A.—*Summary of results of applying various methods of cost allocation to the Colorado River storage project (including Glen Canyon, Flaming Gorge, Curecanti, and Navajo Dam)*

[Thousands of dollars]

	Irrigation [1]	Power	Total [2]
1. Alternative justifiable expenditure:			
Allocation of joint costs	[2] 23,735	208,958	232,693
Specific costs	35,294	341,432	376,726
Total construction cost	59,029	550,390	609,419
Interest during construction		24,358	24,358
Reimbursable allocation	59,029	574,748	633,779
2. Priority of use:			
Allocation of joint costs	[3] 53,485	179,208	232,693
Specific costs	35,294	341,432	376,726
Total construction cost	88,779	520,640	609,419
Interest during construction		22,204	22,204
Reimbursable allocation	88,779	542,844	631,623
3. Average of alternative justifiable expenditure and priority of use:			
Allocation of joint costs	38,610	194,083	232,693
Specific costs	35,294	341,432	376,726
Total construction cost	73,904	535,515	609,419
Interest during construction		23,281	23,281
Reimbursable allocation	73,904	558,796	632,700
4. Separable costs-remaining benefits:			
Allocation of joint costs	20,340	159,660	180,000
Separable costs	35,294	394,125	429,419
Total construction costs	55,634	553,785	609,419
Interest during construction		24,574	24,574
Reimbursable allocation	55,634	578,359	633,993

[1] The $35,294,000 cost of the Navajo Dam as allocated to irrigation in the Navajo project has been included in the costs allocated to irrigation.
[2] Possible minor allocations to other purposes may be made at a later date.
[3] Joint costs allocated to irrigation limited to justifiable alternative cost.

Colorado River Storage Project—Continued

TABLE 2–B.—*Cost allocations by alternative justifiable expenditure method, Colorado River storage project (Glen Canyon, Flaming Gorge, Curecanti)*

[Thousands of dollars]

Item	Irrigation and other water-consuming uses	Power	Total
1. Benefits [1]	(2)	$1,751,100	
2. Alternative single purpose cost [2]	$58,614	1,356,473	$1,415,087
3. Benefits limited by alternative cost	58,614	1,356,473	1,415,087
4. Specific costs [3]	0	839,148	839,148
(a) Construction cost		341,432	341,432
(b) Interest during construction		10,320	10,320
(c) Operation, maintenance, and replacement		172,379	172,379
(d) Taxes foregone		315,017	315,017
5. Remaining benefits	58,614	517,325	575,939
6. Allocated joint costs [3]	25,715	226,386	252,101
(a) Construction costs	23,735	208,958	232,693
(b) Interest during construction	1,595	14,038	15,633
(c) Operation, maintenance, and replacement	385	3,390	3,775
7. Total allocation [3]	25,715	1,065,534	1,091,249
(a) Construction cost	23,735	550,390	574,125
(b) Interest during construction	1,595	24,358	25,953
(c) Operation, maintenance, and replacement	385	175,769	176,154
(d) Taxes foregone		315,017	315,017
8. Construction cost:			
(a) Including interest during construction	25,330	574,748	600,078
(b) Excluding interest during construction	23,735	550,390	574,125
9. Annual operation, maintenance, and replacement	13.6	6,197.3	6,210.9

[1] Present worth of annual benefits over 100 years at 2½ percent interest.
[2] Greater than alternative costs.
[3] Costs include construction costs and interest during construction plus the present worth of the operation and maintenance and replacement costs over 50 years at 2½ percent interest.

COLORADO RIVER STORAGE PROJECT—Continued

TABLE 2-C.—*Cost allocations by separable cost-remaining benefits Colorado River storage project (Glen Canyon, Flaming Gorge, Curecanti)*

[Thousands of dollars]

Item	Irrigation and other water consuming uses	Power	Total
1. Benefits [1]	(2)	$1,751,100	
2. Alternative single purpose cost [2]	$58,614	1,356,473	$1,415,087
3. Benefits limited by alternative cost	58,614	1,356,473	1,415,087
4. Separable costs [3]	0	896,411	896,411
(a) Construction cost		394,125	394,125
(b) Interest during construction		13,753	13,753
(c) Operation, maintenance and replacement		173,516	173,516
(d) Taxes foregone		315,017	315,017
5. Remaining benefits	58,614	460,062	518,674
6. Allocated joint costs [3]	22,017	172,821	194,838
(a) Construction costs	20,340	159,660	180,000
(b) Interest during construction	1,379	10,821	12,200
(c) Operation, maintenance and replacement	298	2,340	2,638
7. Total allocation [3]	22,017	1,069,232	1,091,249
(a) Construction cost	20,340	553,785	574,125
(b) Interest during construction	1,379	24,574	25,953
(c) Operation, maintenance and replacement	298	175,856	176,154
(d) Taxes foregone		315,017	315,017
8. Construction cost:			
(a) Including interest during construction	21,719	578,359	600,078
(b) Excluding interest during construction	20,340	553,785	574,125
9. Annual operation, maintenance and replacement	15.1	6,195.8	6,210.9

[1] Present worth of annual benefits over 100 years at 2½ percent interest.
[2] Greater than alternative costs.
[3] Costs include construction costs and interest during construction plus the present worth of the operation and maintenance and replacement costs over 50 years at 2½ percent interest.

Colorado River Storage Project—Continued

TABLE 2–D.—*Cost allocations by priority-of-use method Colorado River storage project (Glen Canyon, Flaming Gorge, Curecanti)*

[Thousands of dollars]

Item	Irrigation and water consuming uses	Power	Total
1. Benefits [1]	([2])	$1,751,100	
2. Alternative single-purpose cost [2]	$58,614	1,356,473	$1,415,087
3. Benefits limited by alternative	58,614	1,356,473	1,415,087
4. Separable costs [3]	0	839,148	839,148
(a) Construction cost		341,432	341,432
(b) Interest during construction		10,320	10,320
(c) Operation, maintenance, and replacement		172,379	172,379
(d) Taxes foregone		315,017	315,017
5. Remaining benefits	58,614	517,325	575,939
6. Allocated joint costs [3]	58,614	193,487	252,101
(a) Construction cost	53,485	179,208	232,693
(b) Interest during construction	3,749	11,884	15,633
(c) Operation, maintenance, and replacement	1,380	2,395	3,775
7. Total allocation [3]	58,614	1,032,635	1,091,249
(a) Construction cost	53,485	520,640	574,125
(b) Interest during construction	3,749	22,204	25,953
(c) Operation, maintenance, and replacement	1,380	174,774	176,154
(d) Taxes foregone		315,017	315,017
8. Construction costs:			
(a) Including interest during construction	57,234	542,844	600,078
(b) Excluding interest during construction	53,485	520,640	574,125
9. Annual operation, maintenance, and replacement	48.7	6,162.2	6,210.9

[1] Present worth of annual benefits over 100 years at 2½ percent interest.
[2] Greater than alternative costs.
[3] Costs include construction costs and interest during construction plus the present worth of the operation and maintenance and replacement costs over 50 years at 2½ percent interest.

FRYINGPAN-ARKANSAS PROJECT

STUDY NO. 1.—*Summary of results of applying various methods of cost allocation to the Fryingpan-Arkansas Project, Colorado*

[In thousands of dollars]

	Municipal water	Irrigation	Power	Flood control	Fish and wildlife [1]	Total
1. Separable costs-remaining benefits:						
(1) Allocation of joint costs [2]	8,200	67,653	7,755	17,911		101,519
(2) Add specific costs [3]	16,328		36,796		1,898	55,022
(3) Total construction costs	24,528	67,653	44,551	17,911	1,898	156,541
(4) Interest during construction	542		1,484			2,026
(5) Total allocation	25,070	67,653	46,035	17,911	1,898	158,567
2. Alternative justifiable expenditures:						
(1) Allocation of joint costs [2]	8,527	68,708	7,604	16,680		101,519
(2) Add specific costs [3]	16,328		36,796		1,898	55,022
(3) Total construction costs	24,855	68,708	44,400	16,680	1,898	156,541
(4) Interest during construction	555		1,479			2,034
(5) Total allocation	25,410	68,708	45,879	16,580	1,898	158,575
3. Priority of use:						
(1) Allocation of joint costs [2]	11,188	66,723	[4] 1,713	21,895		101,519
(2) Add specific costs [3]	16,328		36,796		1,898	55,022
(3) Total construction costs	27,516	66,723	38,509	21,895	1,898	156,541
(4) Interest during construction	660		1,283			1,943
(5) Total allocation	28,176	66,723	39,792	21,895	1,898	158,484
4. Average of alternative justifiable expenditure and priority of use:						
(1) Allocation of joint costs [2]	9,857	67,716	4,658	19,288		101,519
(2) Add specific costs [3]	16,328		36,796		1,898	55,022
(3) Total construction costs	26,185	67,716	41,454	18,288	1,898	156,541
(4) Interest during construction	607		1,381			1,988
(5) Total allocation	26,792	67,716	42,835	19,288	1,898	158,529

[1] Allocation limited to specific costs of features for this purpose in all methods in conformance with project report.

[2] Joint costs include costs of dams and reservoirs, collection system, tunnel, etc., which serve multiple uses.

[3] Specific costs include costs of municipal water delivery system; power plants, switchyards, power canal, and transmission system; and features added for fish and wildlife.

[4] Incremental cost of reservoir capacity incurred for power.

FRYINGPAN-ARKANSAS PROJECT—Continued

STUDY NO. 2.—*Allocation of costs by separable costs—remaining benefits method—Fryingpan-Arkansas Project, Colorado*

[In thousands of dollars]

	Municipal water	Irrigation	Power	Flood control	Fish and wildlife	Total
Basic project:						
Annual benefits	400	4,355	3,207	598		8,560
Annual operation, maintenance, and replacement	11	88	840	0		939
Annual net benefits	389	4,267	2,367	598		7,621
Capitalized benefits	14,243	156,232	86,666	21,895	1,898	280,934
Alternative costs	11,188	90,172	59,406	31,579		192,345
Limited benefits	11,188	90,172	59,406	21,895	1,898	184,559
Separable costs	0	6,370	51,133	7,122	1,898	66,523
Taxes included			(12,624)			(12,624)
Remaining benefits	11,188	83,802	8,273	14,773		118,036
Percent distribution	9.5	71.0	7.0	12.5		100.0
Remaining joint costs	8,200	61,283	6,042	10,789		86,314
Separable costs		6,370	38,509	7,122	1,898	53,899
Allocation of construction costs	8,200	67,653	44,551	17,911	1,898	140,213
Interest during construction	324		1,484			1,808
Allocation	8,524	67,653	46,035	17,911	1,898	142,021
Municipal water delivery system:						
Construction cost	16,328					16,328
Interest during construction	218					218
Allocation	16,546					16,546
Summary:						
Total construction costs	24,528	67,653	44,551	17,911	1,898	156,541
Total interest during construction	542		1,484			2,026
Total allocation	25,070	67,653	46,035	17,911	1,898	158,576

FRYINGPAN-ARKANSAS PROJECT—Continued

STUDY NO. 3.—*Allocation of costs by alternative justifiable expenditure method—Fryingpan-Arkansas project, Colorado*

	Municipal water	Irrigation	Power	Flood control	Fish and wildlife	Total
Basic project:						
Annual benefits	400	4,355	3,207	598		8,560
Annual operation, maintenance, and replacements	11	88	840	0		939
Annual net benefits	389	4,267	2,367	598		7,621
Justifiable investment	11,243	156,232	86,666	21,895	1,898	280,934
Alternative costs	11,188	90,172	59,406	31,579		192,345
Alternative justifiable expenditure	11,188	90,172	59,406	21,895	1,898	184,559
Specific costs			49,420		1,898	51,318
Taxes included			(12,624)			(12,624)
Remainder	11,188	90,172	9,986	21,895		133,241
Percent distribution	8.40	67.68	7.49	16.43		100.0
Joint costs	8,527	68,708	7,604	16,680		101,519
Specific costs			36,796		1,898	38,694
Allocation of construction costs	8,527	68,708	44,400	16,680	1,898	140,213
Interest during construction	337		1,479			1,816
Allocation	8,864	68,708	45,879	16,680	1,898	142,029
Municipal water delivery system:						
Construction cost	16,328					16,328
Interest during construction	218					218
Allocation	16,546					16,546
Summary:						
Total construction costs	24,855	68,708	44,400	16,680	1,898	156,541
Total interest during construction	555		1,479			2,034
Total allocation	25,410	68,708	45,879	16,680	1,898	158,575

STUDY NO. 4.—*Allocation of costs by priority of use method—Fryingpan-Arkansas project, Colorado*

[In thousands of dollars]

	Municipal water	Irrigation	Power	Flood control	Fish and wildlife	Total
Basic project:						
Justifiable investment	14,243	156,232	86,666	21,895	1,898	280,934
Alternative costs	11,188	90,172	59,406	31,579		192,345
Alternative justifiable expenditure	11,188	90,172	59,406	21,895	1,898	184,559
Joint costs	11,188	66,723	[1] 1,713	21,895		101,519
Specific costs			36,796		1,898	38,694
Allocation of construction costs	11,188	66,723	38,509	21,895	1,898	140,213
Interest during construction	442		1,283			1,725
Allocation	11,630	66,723	39,792	21,895	1,898	141,938
Municipal water delivery system:						
Construction costs	16,328					16,328
Interest during construction	218					218
Allocation	16,546					16,546
Summary:						
Total construction costs	27,516	66,723	38,509	21,895	1,898	156,541
Total interest during construction	660		1,283			1,943
Total allocation	28,176	66,723	39,792	21,895	1,898	158,484

[1] Incremental cost of reservoir capacity incurred for power.

WEBER BASIN PROJECT

TABLE 1–A.—*Summary of results of applying various methods of cost allocation to the Weber Basin project, Utah*

	Flood control	Irrigation	Municipal and industrial	Recreation	Fish and wildlife	Total
1. Separable costs-remaining benefits:						
(a) Construction cost allocation	$4,162,000	$45,912,000	$14,488,000	$3,048,000	[1] $1,730,000	$70,340,000
Joint costs	(3,858,000)	(11,848,000)	(9,176,000)	(1,673,000)	(0)	(27,555,000)
Separable costs	(340,000)	(34,064,000)	(5,312,000)	(1,375,000)	(1,730,000)	(42,785,000)
(b) Interest during construction	158,000	1,960,000	450,000	224,000	59,000	2,851,000
(c) Annual operation, maintenance, and replacement costs	5,400	220,700	33,000	44,900	10,900	314,900
2. Alternative justifiable expenditure:						
(a) Construction cost allocation	4,891,000	44,055,000	15,046,000	4,618,000	[1] 1,730,000	70,340,000
Joint costs	(4,891,000)	(29,984,000)	(15,046,000)	(3,243,000)	(0)	(53,164,000)
Specific costs	(0)	(14,071,000)	(0)	(1,375,000)	(1,730,000)	(17,176,000)
(b) Interest during construction	174,000	1,845,000	537,000	236,000	59,000	2,851,000
(c) Annual operation, maintenance, and replacement costs	15,200	191,100	46,500	51,200	10,900	314,900
3. Priority of use:						
(a) Construction cost allocation	7,396,000	38,992,000	20,847,000	1,375,000	[1] 1,730,000	70,340,000
Joint costs	(7,396,000)	(24,921,000)	(20,847,000)	(0)	(0)	(53,146,000)
Specific costs	(0)	(14,071,000)	(0)	(1,375,000)	(1,730,000)	(17,176,000)
(b) Interest during construction	0	2,151,000	521,000	120,000	59,000	2,851,000
(c) Annual operation, maintenance, and replacement costs	0	211,400	51,400	41,200	10,900	314,900
4. Average of alternative justifiable expenditure and priority of use:						
(a) Construction cost allocation	6,144,000	41,524,000	17,946,000	2,996,000	[1] 1,730,000	70,340,000
Joint costs	(6,144,000)	(27,453,000)	(17,946,000)	(1,621,000)	(0)	(53,164,000)
Specific costs	(0)	(14,071,000)	(0)	(1,375,000)	(1,730,000)	(17,176,000)
(b) Interest during construction	87,000	1,998,000	529,000	178,000	59,000	2,851,000
(c) Annual operation, maintenance, and replacement costs	7,600	201,200	49,000	46,200	10,900	314,900

[1] These are added costs to the project necessary to mitigate fish and wildlife losses and allocated in accordance with Public Law 732.

TABLE 1–B.—*Cost allocations by alternative justifiable expenditure method (present worth basis), Weber Basin project, Utah*

	Flood control	Irrigation	Municipal and industrial	Recreation	Fish and wildlife	Total
1. Benefits [1]	$7,396,000	$176,550,000	$29,255,000	$7,587,000		
2. Alternative single-purpose costs [2]	21,306,000	63,160,000	22,827,000			
Construction cost	[3] (19,938,000)	[4] (55,001,000)	[5] (20,847,000)	([6])		
Interest during construction	(585,000)	(1,375,000)	(521,000)			
Operation, maintenance, and replacement:						
Annual	27,600	239,200	51,400			
Capitalized	(783,000)	(6,784,000)	(1,459,000)			
3. Justifiable investment	7,396,000	63,160,000	22,827,000	7,587,000	[7] $2,098,000	$103,068,000
4. Specific costs [2]	0	17,638,000	0	2,664,000	[7] 2,098,000	22,400,000
Construction cost		(14,071,000)	0	(1,375,000)	(1,730,000)	(17,176,000)
Interest during construction		(776,000)	0	(120,000)	(59,000)	(955,000)
Operation, maintenance, and replacement costs		(2,791,000)		(1,169,000)	(309,000)	(4,269,000)
5. Remaining alternative	7,396,000	45,522,000	22,827,000	4,923,000	0	80,668,000
Percent distribution	9.2	56.4	28.3	6.1	0	100.0
6. Allocated joint costs [2]	$5,495,000	$33,682,000	$16,902,000	$3,643,000	0	$59,722,000
Construction costs	(4,891,000)	(29,984,000)	(15,046,000)	(3,243,000)	0	(53,164,000)
Interest during construction	(174,000)	(1,069,000)	(537,000)	(116,000)	0	(1,896,000)
Operation, maintenance, and replacement	(430,000)	(2,629,000)	(1,319,000)	(284,000)		(4,662,000)
7. Total allocation [2]	5,495,000	51,320,000	16,902,000	6,307,000	2,098,000	82,122,000
Construction cost	(4,891,000)	(44,055,000)	(15,046,000)	(4,618,000)	(1,730,000)	(70,340,000)
Interest during construction	(174,000)	(1,845,000)	(537,000)	(236,000)	(59,000)	(2,851,000)
Operation, maintenance, and replacement	(430,000)	(5,420,000)	(1,319,000)	(1,453,000)	(309,000)	(8,931,000)
8. Annual operation, maintenance, and replacement costs	15,200	191,100	46,500	51,200	10,900	314,900

[1] Present worth of annual benefits over 100 years at 2½ percent interest.

[2] Costs include construction costs and interest during construction plus the present worth of operation, maintenance and replacement costs over 50 years at 2½ percent interest.

[3] Costs of facilities required to provide the planned flood control benefits.

[4] Cost of single purpose municipal water project with first priority for development of available storage sites and surplus waters. (See table 8, appendix I, Definite Plan Report).

[5] Cost of single-purpose irrigation project with 1st priority for development of available storage site and surplus waters. $5,651,000 added to construction costs shown in table 10, appendix I, Definite Plan Report, to reflect cost of lateral systems now included in the project plan.

[6] Greater than benefits.

[7] Added costs to project necessary to mitigate fish and wildlife losses allocated in accordance with Public Law 732.

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WEBER BASIN PROJECT—Continued

TABLE 1-C.—*Cost allocation by separable costs—remaining benefits method (present worth basis), Weber Basin project, Utah*

Item	Flood control	Irrigation	Municipal and industrial	Recreation	Fish and wildlife	Total
1. Benefits [1]	$7,396,000	$176,550,000	$29,255,000	$7,587,000		
2. Alternative single purpose cost [2]	21,306,000	63,160,000	22,827,000			
Construction costs	(19,938,000)	[3](55,001,000)	[4](20,847,000)	([5])		
Interest during construction	(585,000)	(1,375,000)	(521,000)			
Operation, maintenance, and replacement:						
Annual	27,600	239,200	51,400			
Capitalized	(783,000)	(6,784,000)	(1,459,000)			
3. Benefits limited by alternative cost	7,396,000	63,160,000	22,827,000	7,587,000	[6] $2,098,000	$103,068,000
4. Separable costs [2]	312,000	41,359,000	5,983,000	2,664,000	[6] 2,098,000	52,416,000
Construction costs	(304,000)	(34,064,000)	(5,312,000)	(1,375,000)	(1,730,000)	(42,785,000)
Interest during construction	(8,000)	(1,498,000)	(93,000)	(120,000)	(59,000)	(1,778,000)
Operation, maintenance, and replacement	(0)	(5,797,000)	(578,000)	(1,169,000)	(309,000)	(7,853,000)
5. Remaining benefits	7,084,000	21,801,000	16,844,000	4,923,000	0	50,652,000
Percent distribution	14.0	43.0	33.3	9.7		100.0
6. Allocated joint costs [2]	4,159,000	12,773,000	9,892,000	2,882,000	0	29,706,000
Construction cost	(3,858,000)	(11,848,000)	(9,176,000)	(1,673,000)	0	(27,555,000)
Interest during construction	(150,000)	(462,000)	(357,000)	(104,000)	0	(1,073,000)
Operation, maintenance, and replacement costs	(151,000)	(463,000)	(359,000)	(105,000)	0	(1,078,000)
7. Total allocation [2]	4,471,000	54,132,000	15,875,000	5,546,000	[6] 2,098,000	82,122,000
Construction cost	(4,162,000)	(45,912,000)	(14,488,000)	(3,048,000)	(1,730,000)	(70,340,000)
Interest during construction	(158,000)	(1,960,000)	(450,000)	(224,000)	(59,000)	(2,851,000)
Operation, maintenance, and replacement cost	(151,000)	(6,260,000)	(937,000)	(1,274,000)	(309,000)	(8,931,000)
8. Annual operation, maintenance, and replacement cost	5,400	220,700	33,000	44,900	10,900	314,900

[1] Present worth of benefits over 100 years at 2½ percent interest.
[2] Costs include construction costs, interest during construction, and present worth of operation, maintenance, and replacement costs over 50 years at 2½ percent interest.
[3] Cost of single purpose irrigation project with first priority for development of available storage sites and surplus waters.
[4] Cost of single purpose municipal water project with first priority for development of available storage sites and surplus waters.
[5] Greater than benefits.
[6] Added costs necessary to mitigate fish and wildlife losses allocated in accordance with Public Law 732.

TABLE 1–D.—*Cost allocations by priority [1] of use method (present work basis), Weber Basin project, Utah*

	Flood control	Municipal and industrial	Irrigation	Recreation	Fish and wildlife	Total
1. Benefits [2]	$7,396,000	$29,255,000	$176,550,000	$7,587,000		
2. Alternative single purpose costs [3]	21,306,000	22,827,000	63,160,000			
Construction cost	[4] (19,938,000)	[5] (20,847,000)	[6] (55,001,000)	[7]		
Interest during construction	(585,000)	(521,000)	(1,375,000)			
Operation, maintenance, and replacement:						
Annual	27,600	51,400	239,000			
Capitalized	(783,000)	(1,459,000)	(6,784,000)			
3. Justifiable investment	7,396,000	22,827,000	63,160,000	7,587,000	[8] $2,098,000	$103,068,000
4. Specific costs [3]	0	0	17,638,000	2,664,000	[8] 2,098,000	22,400,000
Construction cost	0	0	(14,071,000)	(1,375,000)	(1,730,000)	17,176,000
Interest during construction	0	0	(776,000)	(120,000)	(59,000)	(955,000)
Operation, maintenance, and replacement	0	0	(2,791,000)	(1,169,000)	(309,000)	(4,269,000)
5. Remaining alternative	7,396,000	22,827,000	45,522,000	4,923,000	0	80,668,000
6. Allocated joint cost [3]	7,396,000	22,827,000	29,499,000	0	0	59,722,000
Costruction cost	7,396,000	(20,847,000)	(24,921,000)	0	0	(53,164,000)
Interest during construction	0	(521,000)	(1,375,000)	0	0	(1,896,000)
Operation, maintenance, and replacement	0	(1,459,000)	(3,203,000)	0	0	(4,662,000)
7. Total allocation [3]	7,396,000	22,827,000	47,137,000	2,664,000	2,098,000	82,122,000
Construction cost	7,396,000	(20,847,000)	(38,992,000)	(1,375,000)	(1,730,000)	(70,340,000)
Interest during construction	0	(521,000)	(2,151,000)	(120,000)	(59,000)	(2,851,000)
Operation, maintenance, and replacement	0	(1,459,000)	(5,994,000)	(1,169,000)	(309,000)	(8,931,000)
8. Annual operation, maintenance, and replacement cost	0	51,400	211,400	41,200	10,900	314,900

[1] First and equal priorities are assigned to flood control and municipal and industrial water in recognition of the urbanization and industrialization taking place in the area. A lesser priority is assigned to irrigation.

[2] Present worth of annual benefits over 100 years at 2½ percent interest.

[3] Costs include construction cost, interest during construction plus the present worth of the operation, maintenance, and replacement costs over 50 years at 2½ percent interest.

[4] Costs of project facilities necessary to provide the planned flood-control benefits.

[5] Cost of single purpose municipal water project with first priority for development of storage sites and surplus waters. (See table 8, appendix I, Definite Plan Report.)

[6] Cost of single purpose irrigation project with first priority for development of storage sites and surplus waters. $5,561,000 added to construction cost shown in table 10, appendix I, Definite Plan Report, to reflect cost of lateral systems now included in the project plan.

[7] Greater than benefits.

[8] Added cost to project required to preserve existing fish and wildlife values in the area.

Boulder Canyon Project

Study No. 1-A.—*Separable costs-remaining benefits allocation*

BOULDER CANYON PROJECT WITHOUT ALL-AMERICAN CANAL SYSTEM

	Irrigation	Power	Flood control	Total
1. Annual benefits	$6,566,400	$12,358,387	(1)	
2. Single-purpose alternative	(66,537,000)		($44,300,000)	
(1) Construction cost	2,342,100		1,560,000	
(2) Interest during construction	117,100		58,500	
(3) Operation, maintenance, and replacement	240,000		195,000	
(a) Total	2,699,200		1,813,500	
3. Justifiable investment	2,699,200	12,358,387	1,813,500	
4. Separable costs, dam and reservoir:				
(1) Construction cost		2,780,000	629,600	
(2) Interest during construction		139,000	39,350	
(3) Operation, maintenance, and replacement		2,899,800		
(a) Total		5,818,800	668,950	
5. Separable costs, distribution system:				
(1) Construction cost				
(2) Interest during construction				
(3) Operation, maintenance, and replacement				
(a) Total				
6. Taxes forgone		1,163,760		
7. Total annual assigned costs		6,982,560	668,950	
8. Remaining benefits	2,699,200	5,375,827	1,144,550	
9. Percent distribution	29.2	58.3	12.5	
10. Remaining costs to be allocated	$19,429,052	$38,791,565	$8,317,231	$66,537,848
(1) Construction cost	$683,903	$1,365,463	$292,766	$2,342,132
(2) Interest during construction	42,744	85,341	18,297	146,382
(3) Operation, maintenance, and replacement	77,935	155,603	33,362	266,900
(a) Total	804,582	1,606,407	344,425	2,755,414
11. Total annual costs (line 7 plus 10 (a))	804,582	8,588,967	1,013,375	10,406,924
Benefit-cost ratio	8.16	1.43	(1)	
12. Capitalization, dam and reservoir costs:				
(1) Separable costs		$78,971,000	$17,861,565	$96,832,565
(2) Joint construction costs	$19,429,052	38,791,565	8,317,231	66,537,848
(3) Nonproject costs				2,156,587
Total construction cost	19,429,052	117,762,565	26,178,796	165,527,000

[1] No attempt has been made to evaluate total flood-control benefits. However, it is known that such benefits are large and greatly exceed the cost of the single-purpose alternative used in making the cost allocations.

BOULDER CANYON PROJECT—Continued

STUDY NO. 1-A.—*Separable costs-remaining benefits allocation*—Continued

BOULDER CANYON PROJECT WITH ALL-AMERICAN CANAL SYSTEM

	Irrigation	Power	Flood control	Total
1. Annual benefits	$10,670,000	$12,358,387	(1)	
2. Single-purpose alternative	(129,370,000)		($49,140,000)	
(1) Construction cost	4,553,800		1,729,700	
(2) Interest during construction	229,300		64,860	
(3) Operation, maintenance, and replacement	1,640,000		195,000	
(a) Total	6,423,100		1,989,560	
3. Justifiable investment	6,423,100	12,358,387	1,989,560	
4. Separable costs, dam and reservoir				
(1) Construction cost		2,780,000	629,600	
(2) Interest during construction		139,000	39,350	
(3) Operation, maintenance, and replacement		2,899,800		
(a) Total		5,818,800	668,950	
5. Separable costs, distribution system	(62,832,345)		(4,838,760)	
(1) Construction cost	2,211,700		170,320	
(2) Interest during construction	82,940		4,260	
(3) Operation, maintenance, and replacement	1,400,000		18,000	
(a) Total	3,694,640		192,580	
6. Taxes foregone		1,163,760		
7. Total annual assigned costs	3,694,640	6,982,560	861,530	$11,538,730
8. Remaining benefits	2,728,460	5,375,827	1,128,030	
9. Percent distribution	29.5	58.2	12.3	
10. Remaining costs to be allocated	$19,628,665	$38,725,028	$8,184,155	($66,537,848)
(1) Construction cost	$690,929	$1,363,121	$288,082	$2,342,132
(2) Interest during construction	43,183	85,195	18,004	146,382
(3) Operation, maintenance, and replacement	78,735	155,336	32,829	266,900
(a) Total	812,847	1,603,652	338,915	2,755,414
11. Total annual costs (line 7 plus 10 (a))	4,507,487	8,586,212	1,200,445	14,294,144
Benefit-cost ratio	2.37	1.43	(1)	
12. Capitalization, dam, and reservoir costs:				
(1) Separable costs	$62,832,345	$78,971,000	$22,700,325	$164,503,670
(2) Joint construction costs	19,628,665	38,725,028	8,184,155	66,537,848
(3) Nonproject costs				2,156,587
Total construction cost	82,461,010	117,696,028	30,884,480	233,198,105

[1] No attempt has been made to evaluate total flood-control benefits. However, it is known that such benefits are large and greatly exceed the cost of the single-purpose alternative used in making the cost allocation.

Boulder Canyon Project—Continued

Study No. 1–B.—*Alternative justifiable expenditure method*

BOULDER CANYON PROJECT WITHOUT ALL-AMERICAN CANAL SYSTEM

	Irrigation	Power [1]	Flood control	Total
1. Annual benefits	$5,566,400	$11,194,627	(2)	
2. Single-purpose alternative	(66,537,000)		($44,300,000)	
(1) Construction cost	2,342,100		1,560,000	
(2) Interest during construction	117,100		58,500	
(3) Operation, maintenance, and replacement	240,000		195,000	
(a) Total	2,699,200		1,813,500	
3. Justifiable investment	2,699,200	11,194,627	1,813,500	
4. Less specific costs		(78,971,000)		
(1) Construction cost		2,780,000		
(2) Interest during construction		139,000		
(3) Operation, maintenance, and replacement		2,899,800		
(a) Total		5,818,800		$5,818,800
5. Remaining alternative	2,699,200	5,375,827	1,813,500	9,888,527
6. Percent distribution	27.3	54.4	18.3	100
7. Total joint costs to be allocated	$23,041,040	$45,913,281	$15,445,092	$84,399,413
(1) Construction cost	$811,044	$1,616,147	$543,667	$2,970,858
(2) Interest during construction	50,690	101,009	33,979	185,678
(3) Operation, maintenance, and replacement	73,664	144,927	48,309	266,900
(a) Total	935,398	1,862,083	625,955	3,423,436
8. Total annual costs (line 4 (a) plus 7 (a)	935,398	7,680,083	625,955	9,241,436
Benefit-cost ratio	7.0	1.46	(2)	
9. Project construction cost allocation:				
(1) Joint project costs	$23,041,040	$45,913,281	$15,445,092	$84,399,413
(2) Specific project costs		78,971,000		78,971,000
(a) Total	23,041,040	124,884,281	15,445,092	163,370,413
(3) Nonproject costs				2,156,587
(a) Total project costs	23,041,040	124,884,281	15,445,092	165,527,000
Hoover Dam and Reservoir				165,527,000

[1] Excludes taxes foregone.

[2] No attempt has been made to evaluate total flood-control benefits. However, it is known that such benefits are large and greatly exceed the cost of the single-purpose alternative used in making the cost allocations.

BOULDER CANYON PROJECT—Continued

STUDY NO. 1–B.—*Alternative justifiable expenditure method*—Continued

BOULDER CANYON PROJECT WITH ALL-AMERICAN CANAL SYSTEM

	Irrigation	Power [1]	Flood control	Total
1. Annual benefits	$10,670,000	$11,194,627	[2]	
2. Single-purpose alternative	(129,370,000)		($49,140,000)	
(1) Construction cost	4,553,800		1,729,700	
(2) Interest during construction	229,300		64,860	
(3) Operation, maintenance and replacement	1,640,000		195,000	
(a) Total	6,423,100		1,989,560	
3. Justifiable investment	6,423,100	11,194,627	1,989,560	
4. Less specific costs	(62,832,345)	(78,971,000)	(4,838,760)	
(1) Construction cost	2,211,700	2,780,000	170,320	
(2) Interest during construction	82,940	139,000	4,260	
(3) Operation, maintenance and replacement	1,400,000	2,899,800	18,000	
(a) Total	3,694,640	5,818,800	192,580	
5. Remaining alternative	2,728,460	5,375,827	1,796,980	$9,901,267
6. Percent distribution	27.5	54.3	18.1	100
7. Total joint costs to be allocated	$23,294,238	$45,828,881	$15,276,294	$84,399,413
(1) Construction cost	$819,957	$1,613,177	$537,725	$2,970,859
(2) Interest during construction	51,247	100,823	33,608	185,678
(3) Operation, maintenance and replacement	73,664	144,927	48,309	266,900
(a) Total	944,868	1,858,927	619,642	3,423,437
8. Total annual costs (line 4 (a) plus 7 (a))	4,639,508	7,677,727	812,222	13,129,457
Benefit-cost ratio	2.3	1.5	[2]	
9. Project construction cost allocation:				
(1) Joint project costs	$23,294,238	$45,828,881	$15,276,294	$84,399,413
(2) Specific project costs	62,832,345	78,971,000	4,838,760	146,642,105
(a) Subtotal	86,126,583	124,799,881	20,115,054	231,041,518
(3) Nonproject costs				2,156,587
(a) Total project costs	86,126,583	124,799,881	20,115,054	233,198,105
Hoover Dam and Reservoir				165,527,000
All-American Canal system				67,671,105

[1] Excludes taxes foregone.

[2] No attempt has been made to evaluate total flood control benefits. However, it is known that such benefits are large and greatly exceed the cost of the single-purpose alternative used in making the cost allocations

Boulder Canyon Project—Continued

Study No. 1-C.—*Priority of use method*

BOULDER CANYON PROJECT WITHOUT ALL-AMERICAN CANAL SYSTEM

	Flood control	Irrigation	Power	Total
Remaining alternative [1]	$51,435,052	$76,555,552	$152,470,881	
Allocation of joint reservoir costs	44,300,000	40,099,413		$84,399,413
Specific project costs			78,971,000	
Total allocation of project construction costs	44,300,000	40,099,413	78,971,000	163,370,413
Nonproject costs				2,156,587
Total				165,527,000
Recapitulation of reimbursable power costs:				
Dam and reservoir			78,971,000	
Interest during construction [2]			3,948,500	
Total power investment			82,919,500	
Final allocation	44,300,000	40,099,413	82,919,500	167,318,913

BOULDER CANYON PROJECT WITH ALL-AMERICAN CANAL SYSTEM

	Flood control	Irrigation	Power	Total
Remaining alternative [3]	$50,966,507	$77,385,433	$152,470,881	
Allocation of joint reservoir costs	44,300,000	40,099,413		$84,399,413
Specific project costs	4,838,760	62,832,345	78,971,000	146,642,105
Total allocation of project construction costs	49,138,760	102,931,758	78,971,000	231,041,518
Nonproject costs				2,156,587
Total				233,198,105
Recapitulation of reimbursable power costs:				
Dam and reservoir			78,971,000	
Interest during construction			3,948,500	
Total power investment			82,919,500	
Final allocation	49,138,760	102,931,758	82,919,500	234,990,018

[1] From line 5, study No. 1-B, capitalized 50 years at 2½ percent.
[2] Interest on specific power facilities only.
[3] From line 5, study No. 1-B, capitalized 50 years at 2½ percent.

Boulder Canyon Project—Continued

Summary of results of applying various methods of cost allocation to the Boulder Canyon project without all-American canal system

	Irrigation	Power	Flood control	Total
1. Separable costs-remaining benefits:				
(1) Allocation of joint reservoir costs [1]	$19,429,052	$38,791,565	$8,317,231	$66,537,848
(2) Add separable reservoir costs		78,971,000	17,861,565	96,832,565
(a) Subtotal, reservoir allocation	19,429,052	117,762,565	26,178,796	163,370,413
(3) Interest during construction [3]		3,948,500		3,948,500
(a) Final reservoir allocation	19,429,052	121,711,065	26,178,796	167,318,913
2. Alternative justifiable expenditure:				
(1) Allocation of joint reservoir costs [1]	23,041,040	45,913,281	15,445,092	84,399,413
(2) Add specific reservoir costs [2]		78,971,000		78,971,000
(a) Subtotal, reservoir allocation	23,041,040	124,884,281	15,445,092	163,370,413
(3) Interest during construction [3]		3,948,500		3,948,500
(a) Final reservoir allocation	23,041,040	128,832,781	15,445,092	167,318,913
3. Priority of use:				
(1) Allocation of joint reservoir costs [1]	40,099,413		44,300,000	84,399,413
(2) Allocation of specific reservoir costs [2]		78,971,000		78,971,000
(a) Subtotal, reservoir allocation	40,099,413	78,971,000	44,300,000	163,370,413
(3) Interest during construction [3]		3,948,500		3,948,500
(a) Final reservoir allocation	40,099,413	82,919,500	44,300,000	167,318,913
4. Average of alternative justifiable expenditure and priority of use:				
(1) Allocation of joint reservoir costs [1]	31,570,227	22,956,640	29,872,546	84,399,413
(2) Allocation of specific reservoir costs [2]		78,971,000		78,971,000
(a) Subtotal, reservoir allocation	31,570,227	101,927,640	29,872,546	163,370,413
(3) Interest during construction [3]		3,948,500		3,948,500
(a) Final reservoir allocation	31,570,227	105,876,140	29,872,546	167,318,913

[1] Costs related only to multiple functions, excluding powerplant, switchyard, etc.; including separable reservoir costs.
[2] Costs related to 1 function only, i. e., powerplant, switchyard, recreation facilities, etc.
[3] Includes interest on specific power features only.

BOULDER CANYON PROJECT—Continued

Summary of results of applying various methods of cost allocation to the Boulder Canyon project with All-American Canal system

	Irrigation	Power	Flood control	Total
1. Separable costs-remaining benefits:				
(1) Allocation of joint reservoir costs [1]	$19,628,665	$38,725,028	$8,184,155	$66,537,848
(2) Add separable reservoir costs [1]		78,971,000	17,861,565	96,832,565
(a) Subtotal, reservoir allocation	19,628,665	117,696,028	26,045,720	163,370,413
(3) Interest during construction [3]		3,948,500		3,948,500
(a) Final reservoir allocation	19,628,665	121,644,528	26,045,720	167,318,913
Distribution system allocation	62,832,345		4,838,760	67,671,105
Total, irrigation allocation	82,461,010	121,644,528	30,884,480	234,990,018
2. Alternative justifiable expenditure:				
(1) Allocation of joint reservoir costs [1]	23,294,238	45,828,881	15,276,294	84,399,413
(2) Add specific reservoir costs [2]		78,971,000		78,971,000
(a) Subtotal, reservoir allocation	23,294,238	124,799,881	15,276,294	163,370,413
(3) Interest during construction [3]		3,948,500		3,948,500
(a) Final reservoir allocation	23,294,238	128,748,381	15,276,294	167,318,913
Distribution system allocation	62,832,345		4,838,760	67,671,105
Total, irrigation allocation	86,126,583	128,748,381	20,115,054	234,990,018
3. Priority of use:				
(1) Allocation of joint reservoir costs [1]	40,099,413		44,300,000	84,399,413
(2) Allocation of specific reservoir costs [2]		78,971,000		78,971,000
(a) Subtotal, reservoir allocation	40,099,413	78,971,000	44,300,000	163,370,413
(3) Interest during construction [3]		3,948,500		3,948,500
(a) Final reservoir allocation	40,099,413	82,919,500	44,300,000	167,318,913
Distribution system allocation	62,832,345		4,838,760	67,671,105
Total, irrigation allocation	102,931,758	82,919,500	49,138,760	234,990,018
4. Average of alternative justifiable expenditure and priority of use:				
(1) Allocation of joint reservoir costs [1]	31,696,826	22,914,440	29,788,147	84,399,413
(2) Allocation of specific reservoir costs [2]		78,971,000		78,971,000
(a) Subtotal, reservoir allocation	31,696,826	101,885,440	29,788,147	
(3) Interest during construction [3]		3,948,500		3,948,500
(a) Final reservoir allocation	31,696,826	105,833,940	29,788,147	167,318,913
Distribution system allocation	62,832,345		4,838,760	67,671,105
Total, irrigation allocation	94,529,171	105,833,940	34,626,907	234,990,018

[1] Costs related only to multiple functions, excluding powerplant, switchyard, etc., including separable reservoir costs.
[2] Costs related to 1 function only, i. e., powerplant, switchyard, recreation facilities, etc.
[3] Includes interest on specific power features only.

Missouri River Basin Project

Table 1.—*Summary of results of applying various methods of cost allocation—Missouri River Basin project, Bureau of Reclamation and Corps of Engineers programs—All active units and divisions*

[In thousands of dollars]

Method	Irrigation	Power	Municipal water	Flood control and navigation	Fish and wildlife	Recreation	Total project cost
1. Separable costs-remaining benefits:							
(1) Allocation of joint costs	528,922	403,488	11,401	462,049	1,895		1,407,755
(2) Add specific costs	1,420,118	1,006,683	3,005	1,385,869	397	16,047	3,832,119
(a) Subtotal construction cost allocation	1,949,040	1,410,171	14,406	1,847,918	2,292	16,047	5,239,874
(3) Suballocation power investment to irrigation [1]	282,034	−282,034					
(4) Interest during construction		53,938	960				54,898
(5) Fort Peck transmission [2]		23,859					23,859
(6) Total allocation	2,231,074	1,205,934	15,366	1,847,918	2,292	16,047	5,318,631
2. Alternative justifiable expenditure:							
(1) Allocation of joint costs	526,979	405,466	5,206	467,556	2,548		1,407,755
(2) Add specific costs	1,420,118	1,006,683	3,005	1,385,869	397	16,047	3,832,119
(a) Subtotal construction cost allocation	1,947,097	1,412,149	8,211	1,853,425	2,945	16,047	5,239,874
(3) Suballocation power investment to irrigation [1]	282,430	−282,430					
(4) Interest during construction		53,518	426				53,944
(5) Fort Peck transmission [2]		23,859					23,859
(6) Total allocation	2,229,527	1,207,096	8,637	1,853,425	2,945	16,047	5,317,677
3. Priority of use:							
(1) Allocation of joint costs	593,393	185,726	17,196	607,689	3,252		1,407,755
(2) Add specific costs	1,420,118	1,006,683	3,005	1,385,869	397	16,047	3,832,119
(a) Subtotal construction cost allocation	2,014,010	1,192,409	20,201	1,993,558	3,649	16,047	5,239,874
(3) Suballocation power investment to irrigation [1]	238,482	−238,482					
(4) Interest during construction		43,960	1,297				45,257
(5) Fort Peck transmission [2]		23,859					23,859
(6) Total allocation	2,252,492	1,021,746	21,498	1,993,558	3,649	16,047	5,308,990
4. Average of alternative justifiable expenditure and priority of use:							
(1) Allocation of joint costs	560,395	295,593	11,202	537,665	2,900		1,407,755
(2) Add specific costs	1,420,118	1,006,683	3,005	1,385,869	397	16,047	3,832,119
(a) Subtotal construction cost allocation	1,980,513	1,302,276	14,207	1,923,534	3,297	16,047	5,239,874
(3) Suballocation power investment to irrigation [1]	260,455	−260,455					
(4) Interest during construction		48,666	863				49,529
(5) Fort Peck transmission [2]		23,859					23,859
(6) Total allocation	2,240,968	1,114,346	15,070	1,923,534	3,297	16,047	5,313,262

[1] Apportioned 80 percent to power and 20 percent to irrigation based on installed capac-ities.

[2] Includes $582,000 interest during construction.

Missouri River Basin Project—Continued

TABLE 2.—*Summary of results of applying various methods of cost allocation—Missouri River Basin project, Bureau of Reclamation and Corps of Engineers programs—units completed, under construction and proposed in 6-year programs*

[In thousands of dollars]

Method	Irrigation	Power	Municipal water	Flood control and navigation	Fish and wildlife	Recreation	Total project cost
1. Separable costs-remaining benefits:							
(1) Allocation of joint costs	377,499	361,211	4,170	368,830	952		1,112,662
(2) Add specific costs	671,702	692,663	2,780	991,805	236	15,098	2,374,284
(a) Subtotal construction cost allocation	1,049,201	1,053,874	6,950	1,360,635	1,188	15,098	3,486,946
(3) Suballocation power investment to irrigation [1]	210,775	−210,775					
(4) Interest during construction		44,958	343				45,301
(5) Fort Peck transmission [2]		21,968					21,968
(6) Total allocation	1,259,976	910,025	7,293	1,360,635	1,188	15,098	3,554,215
2. Alternative justifiable expenditure:							
(1) Allocation of joint costs	356,723	375,893	3,734	374,707	1,605		1,112,662
(2) Add specific costs	671,702	692,663	2,780	991,805	236	15,098	2,374,284
(a) Subtotal construction cost allocation	1,028,425	1,068,556	6,514	1,366,512	1,841	15,098	3,486,946
(3) Suballocation power investment to irrigation [1]	213,711	−213,711					
(4) Interest during construction		45,264	309				45,573
(5) Fort Peck transmission [2]		21,968					21,968
(6) Total allocation	1,242,136	922,077	6,823	1,366,512	1,841	15,098	3,554,487
3. Priority of use:							
(1) Allocation of joint costs	427,854	183,317	5,297	493,915	2,279		1,112,662
(2) Add specific costs	671,702	692,663	2,780	991,805	236	15,098	2,374,284
(a) Subtotal construction cost allocation	1,099,556	875,980	8,077	1,485,720	2,515	15,098	3,486,946
(3) Suballocation power investment to irrigation [1]	175,193	−175,196					
(4) Interest during construction		35,942	402				36,344
(5) Fort Peck transmission [2]		21,968					21,968
(6) Total allocation	1,274,752	758,694	8,479	1,485,720	2,515	15,098	3,545,258

4. Average of alternative justifiable expenditure and priority of use:							
(1) Allocation of joint costs	392,251	279,603	4,516	434,350	1,942		1,112,662
(2) Add specific costs	671,702	692,663	2,780	991,805	236	15,098	2,374,284
(a) Subtotal construction cost allocation	1,063,953	972,266	7,296	1,426,155	2,178	15,098	3,486,946
(3) Suballocation power investment to irrigation [1]	194,453	−194,453					
(4) Interest during construction		40,602	357				40,959
(5) Fort Peck transmission [2]		21,968					21,968
(6) Total allocation	1,258,406	840,383	7,653	1,426,155	2,178	15,098	3,549,873

[1] Apportioned 80 percent to power and 20 percent to irrigation based on installed capacities.

[2] Includes $536,000 interest during construction.

Missouri River Basin Project—Continued

TABLE 3.—*Summary of results of applying various methods of cost allocation, Missouri River Basin project, Bureau of Reclamation program—All active units and divisions*

[In thousands of dollars]

Method	Irrigation	Power	Municipal water	Flood control and navigation	Fish and wildlife	Recreation	Total project cost
1. Separable costs-remaining benefits:							
(1) Allocation of joint costs	$341,523	$113,988	$11,401	$176,159	$1,895		$644,966
(2) Add specific costs	1,419,839	588,483	3,005	8,194	369	$12,505	2,032,395
(a) Subtotal construction cost allocation	1,761,362	702,471	14,406	184,353	2,264	12,505	2,677,361
(3) Suballocation power investment to irrigation [1]	140,494	−140,494					
(4) Interest during construction		19,698	960				20,658
(5) Fort Peck transmission [2]		23,859					23,859
(6) Total allocation	1,901,856	605,534	15,366	184,353	2,264	12,505	2,721,878
2. Alternative justifiable expenditure:							
(1) Allocation of joint costs	362,457	101,166	5,206	173,589	2,548		644,966
(2) Add specific costs	1,419,839	588,483	3,005	8,194	369	12,505	2,032,395
(a) Subtotal construction cost allocation	1,782,296	689,649	8,211	181,783	2,917	12,505	2,677,361
(3) Suballocation power investment to irrigation [1]	137,930	−137,930					
(4) Interest during construction		19,278	426				19,704
(5) Fort Peck transmission [2]		23,859					23,859
(6) Total allocation	1,920,226	594,856	8,637	181,783	2,917	12,505	2,720,924
3. Priority of use:							
(1) Allocation of joint costs	367,421	27,066	17,196	230,031	3,252		644,966
(2) Add specific costs	1,419,839	588,483	3,005	8,194	369	12,505	2,032,395
(a) Subtotal construction cost allocation	1,787,260	615,549	20,201	238,225	3,621	12,505	2,677,361
(3) Suballocation power investment to irrigation [1]	123,110	−123,110					
(4) Interest during construction		16,568	1,297				17,865
(5) Fort Peck transmission [2]		23,859					23,859
(6) Total allocation	1,910,370	532,866	21,498	238,225	3,621	12,505	2,719,085

4. Average of alternative justifiable expenditure and priority of use:							
(1) Allocation of joint costs	364,899	64,113	11,202	201,852	2,900		644,966
(2) Add specific costs	1,419,839	588,483	3,005	8,194	369	12,505	2,032,395
(a) Subtotal construction cost allocation	1,784,738	652,596	14,207	210,046	3,269	12,505	2,677,361
(3) Suballocation power investment to irrigation [1]	130,519	−130,519					
(4) Interest during construction		17,690	863				18,553
(5) Fort Peck transmission [2]		23,859					23,859
(6) Total allocation	1,915,257	563,626	15,070	210,046	3,269	12,505	2,719,773

[1] Apportioned 80 percent to power and 20 percent to irrigation based on installed capacities.

[2] Includes $582,000 interest during construction.

Missouri River Basin Project—Continued

TABLE 4.—*Summary of results of applying various methods of cost allocation, Missouri River Basin project, Bureau of Reclamation program—Units completed, under construction, and proposed in 6-year program*

[In thousands of dollars]

Method	Irrigation	Power	Municipal water	Flood control and navigation	Fish and wildlife	Recreation	Total project cost
1. Separable costs-remaining benefits:							
(1) Allocation of joint costs	195,175	71,711	4,170	90,267	952		362,275
(2) Add specific costs	671,423	274,463	2,780	2,299	226	11,636	962,827
(a) Subtotal construction cost allocation	866,598	346,174	6,950	92,566	1,178	11,636	1,325,102
(3) Suballocation power investment to irrigation [1]	69,235	−69,235					
(4) Interest during construction		10,718	343				11,061
(5) Fort Peck transmission [2]		21,968					21,968
(6) Total allocation	935,833	309,625	7,293	92,566	1,178	11,636	1,358,131
2. Alternative justifiable expenditure:							
(1) Allocation of joint costs	197,782	71,593	3,734	87,561	1,605		362,275
(2) Add specific costs	671,423	274,463	2,780	2,299	226	11,636	962,827
(a) Subtotal construction cost allocation	869,205	346,056	6,514	89,860	1,831	11,636	1,325,102
(3) Suballocation power investment to irrigation [1]	69,211	−69,211					
(4) Interest during construction		10,704	309				11,013
(5) Fort Peck transmission [2]		21,968					21,968
(6) Total allocation	938,416	309,517	6,823	89,860	1,831	11,636	1,358,083
3. Priority of use:							
(1) Allocation of joint costs	205,243	24,657	5,297	124,799	2,279		362,275
(2) Add specific costs	671,423	274,463	2,780	2,299	226	11,636	962,827
(a) Subtotal, construction cost allocation	876,666	299,120	8,077	127,098	2,505	11,636	1,325,102
(3) Suballocation power investment to irrigation [1]	59,824	−59,824					
(4) Interest during construction		8,550	402				8,952
(5) Fort Peck transmission [2]		21,968					21,968
(6) Total allocation	936,490	269,814	8,479	127,098	2,505	11,636	1,356,022

4. Average of alternative justifiable expenditure and priority of use:							
(1) Allocation of joint costs	201 475	48, 123	4, 516	106, 219	1, 942		362, 275
(2) Add specific costs	671, 423	274, 463	2, 780	2, 299	226	11, 636	962, 827
(a) Subtotal, construction cost allocation	872, 898	322, 586	7, 296	108, 518	2, 168	11, 636	1, 325, 102
(3) Suballocation power investment to irrigation [1]	64, 517	−64, 517					
(4) Interest during construction		9, 626	357				9, 983
(5) Fort Peck transmission [2]		21, 968					21, 968
(6) Total allocation	937, 415	289, 663	7, 653	108, 518	2, 168	11, 636	1, 357, 053

[1] Apportioned 80 percent to power and 20 percent to irrigation based on installed capacities.

[2] Includes $536,000 interest during construction.

Missouri River Basin Project—Continued

TABLE 5.—*Summary of results of applying various methods of cost allocation, Missouri River Basin project, Corps of Engineers program—All active units and divisions*

[In thousands of dollars]

Method	Irrigation	Power	Municipal water	Flood control and navigation	Fish and wildlife	Recreation	Total project cost
1. Separable costs-remaining benefits:							
(1) Allocation of joint costs	187,399	289,500		285,890			762,789
(2) Add specific costs	279	418,200		1,377,675	28	3,542	1,799,724
(a) Subtotal construction cost allocation	187,678	707,700		1,663,565	28	3,542	2,562,513
(3) Suballocation power investment to irrigation [1]	141,540	−141,540					
(4) Interest during construction		34,240					34,240
(5) Total allocation	329,218	600,400		1,663,565	28	3,542	2,596,753
2. Alternative justifiable expenditure:							
(1) Allocation of joint costs	164,522	304,300		293,967			762,789
(2) Add specific costs	279	418,200		1,377,675	28	3,542	1,799,724
(a) Subtotal construction cost allocation	164,801	722,500		1,671,642	28	3,542	2,562,513
(3) Suballocation power investment to irrigation [1]	144,500	−144,500					
(4) Interest during construction		34,560					34,560
(5) Total allocation	309,301	612,560		1,671,642	28	3,542	2,597,073
3. Priority of use:							
(1) Allocation of joint costs	226,471	158,660		377,658			762,789
(2) Add specific costs	279	418,200		1,377,675	28	3,542	1,799,724
(a) Subtotal construction cost allocation	226,750	576,860		1,755,333	28	3,542	2,562,513
(3) Suballocation power investment to irrigation [1]	115,372	−115,372					
(4) Interest during construction		27,392					27,392
(5) Total allocation	342,122	488,880		1,755,333	28	3,542	2,589,905
4. Average of alternative justifiable expenditure and priority of use:							
(1) Allocation of joint costs	195,496	231,480		335,813			762,789
(2) Add specific costs	279	418,200		1,377,675	28	3,542	1,799,724
(a) Subtotal construction cost allocation	195,775	649,680		1,713,488	28	3,542	2,562,513
(3) Suballocation power investment to irrigation [1]	129,936	−129,936					
(4) Interest during construction		30,976					30,976
(5) Total allocation	325,711	550,720		1,713,488	28	3,542	2,593,489

[1] Apportioned 80 percent to power and 20 percent to irrigation based on installed capacities.

TABLE 6.—*Summary of results of applying various methods of cost allocation, Missouri River Basin project, Corps of Engineers program—units completed, under construction, and proposed in 6-year program*

[In thousands of dollars]

Method	Irrigation	Power	Municipal water	Flood control and navigation	Fish and wildlife	Total Recreation	Total project cost
1. Separable costs-remaining benefits:							
(1) Allocation of joint costs	182,324	289,500		278,563			750,387
(2) Add specific costs	279	418,200		989,506	10	3,462	1,411,457
(a) Subtotal construction cost allocation	182,603	707,700		1,268,069	10	3,462	2,161,844
(3) Suballocation power investment to irrigation [1]	141,540	−141,540					
(4) Interest during construction		34,240					34,240
(5) Total allocation	324,143	600,400		1,268,069	10	3,462	2,196,084
2. Alternative justifiable expenditure:							
(1) Allocation of joint costs	158,941	304,300		287,146			750,387
(2) Add specific costs	279	418,200		989,506	10	3,462	1,411,457
(a) Subtotal construction cost allocation	159,220	722,500		1,276,652	10	3,462	2,161,844
(3) Suballocation power investment to irrigation [1]	144,500	−144,500					
(4) Interest during construction		34,560					34,560
(5) Total allocation	303,720	612,560		1,276,652	10	3,462	2,196,404
3. Priority of use:							
(1) Allocation of joint costs	222,611	158,650		369,116			750,387
(2) Add specific costs	279	418,200		989,506	10	3,462	1,411,457
(a) Subtotal construction cost allocation	222,890	576,850		1,358,622	10	3,462	2,161,844
(3) Suballocation power investment to irrigation [1]	115,372	−115,372					
(4) Interest during construction		27,392					27,392
(5) Total allocation	338,262	488,880		1,358,622	10	3,462	2,189,236
4. Average of alternative justifiable expenditure and priority of use:							
(1) Allocation of joint costs	190,776	231,480		328,131			750,387
(2) Add specific costs	279	418,200		989,506	10	3,462	1,411,457
(a) Subtotal construction cost allocation	191,055	649,680		1,317,637	10	3,462	2,161,844
(3) Suballocation power investment to irrigation [1]	129,936	−129,936					
(4) Interest during construction		30,976					30,976
(5) Total allocation	320,991	550,720		1,317,637	10	3,462	2,192,820

[1] Apportioned 80 percent to power and 20 percent to irrigation based on installed capacities.

Missouri River Basin Project—Continued

TABLE 7.—*Summary of results of applying various methods of cost allocation, Missouri River Basin project, main-stem reservoirs—Fort Peck, Garrison, Oahe, Fort Randall, Gavins Point, and Big Bend*

[In thousands of dollars]

Method	Irrigation	Power	Municipal water	Flood control and navigation	Fish and wildlife	Recreation	Total project cost
1. Separable costs-remaining benefits:							
(1) Allocation of joint costs	166,300	289,500		237,200			693,000
(2) Add specific costs		418,200		15,200		3,200	536,600
(a) Subtotal construction cost allocation	166,300	707,700		252,400		3,200	1,129,600
(3) Suballocation power investment to irrigation [1]	141,540	−141,540					
(4) Interest during construction		34,240					34,240
(5) Total allocation	307,840	600,400		252,400		3,200	1,163,840
2. Alternative justifiable expenditure:							
(1) Allocation of joint costs	142,500	304,300		246,200			693,000
(2) Add specific costs		418,200		15,200		3,200	536,600
(a) Subtotal construction cost allocation	142,500	722,500		261,400		3,200	1,129,600
(3) Suballocation power investment to irrigation [1]	144,500	−144,500					
(4) Interest during construction		34,560					34,560
(5) Total allocation	287,000	612,560		261,400		3,200	1,164,160
3. Priority of use:							
(1) Allocation of joint costs	214,340	138,660		320,000			693,000
(2) Add specific costs		418,200		15,200		3,200	536,600
(a) Subtotal construction cost allocation	214,340	576,860		335,200		3,200	1,129,600
(3) Suballocation power investment to irrigation [1]	115,372	−115,372					
(4) Interest during construction		27,392					27,392
(5) Total allocation	329,712	488,880		335,200		3,200	1,156,992
4. Average of alternative justifiable expenditure and priority of use:							
(1) Allocation of joint costs	178,420	231,480		283,100			693,000
(2) Add specific costs		418,200		15,200		3,200	536,600
(a) Subtotal construction cost allocation	178,420	649,680		298,300		3,200	1,129,600
(3) Suballocation power investment to irrigation [1]	129,936	−129,936					
(4) Interest during construction		30,976					30,976
(5) Total allocation	308,356	550,720		298,300		3,200	1,160,576

[1] Apportioned 80 percent to power and 20 percent to irrigation based on installed capacities.

COLUMBIA BASIN PROJECT

STUDY NO. 1-A.—*Separable costs-remaining benefits allocation*

	Irrigation	Power	Navigation	Total
1. Annual benefits	$100,369,000	$62,061,000	$40,000	$162,470,000
2. Single-purpose alternative	(642,839,000)	269,794,000		
(1) Construction cost	22,665,503	9,512,517		
(2) Interest during construction	1,276,391	510,648		
(3) Operation, maintenance, and replacements	4,485,000	3,655,000		
(4) Taxes foregone		3,990,000		
(a) Total	28,426,894	17,668,165	More	
3. Justifiable investment	28,426,894	17,668,165	40,000	
4. Separable cost, dam and reservoir	(1,683,000)	(157,955,000)		
(1) Construction cost	59,340	5,569,248		
(2) Interest during construction	0	278,365		
(3) Operation, maintenance, and replacements	72,000	3,005,000		
(a) Total	131,340	8,852,613		
5. Separable cost, distribution system	(481,885,000)			
(1) Construction cost	16,990,515			
(2) Interest during construction	790,318			
(3) Operation, maintenance, and replacement	6,472,000			
(a) Total	24,252,833			
6. Taxes foregone		3,990,000		
7. Total annual assigned costs	24,382,833	12,842,613		37,226,446
8. Remaining benefits	4,043,061	4,825,552	40,000	8,908,613
9. Percent distribution	45.4	54.2	0.4	100
10. Remaining costs to be allocated				(111,839,000)
(1) Construction cost	1,790,244	2,137,252	15,773	3,943,269
(2) Interest during construction	105,456	125,897	932	232,285
(3) Operation, maintenance, and replacement	295,000	352,000	3,000	650,000
(a) Total	2,190,700	2,615,149	19,705	4,825,554
11. Total annual costs (line 7 plus 10 (a))	26,573,533	15,457,762	19,705	42,051,000
Benefit-cost ratio	3.78	4.01	2.03	3.86
12. Capitalization, dam and reservoir costs:				
(1) Separable costs	1,683,001	157,954,927		159,637,928
(2) Joint construction costs	50,774,900	60,616,741	447,354	111,838,995
Total construction cost	52,457,901	218,571,668	447,354	271,476,923
13. Recapitulation of total power costs:				
(a) Dam and reservoir		218,571,668		
(1) Interest during construction		11,465,679		
(b) Total power investment		230,037,347		
(c) Reimbursable with interest (92½ percent)		212,784,547		
14. Power investment to irrigation	16,392,825			
15. Final allocation	68,850,726	212,784,547	447,354	282,082,627
Total (rounded)	68,851,000	212,785,000	447,000	282,083,000

COLUMBIA BASIN PROJECT—Continued

STUDY NO. 1–B.—*Alternative justifiable expenditure method*

	Irrigation	Power	Navigation	Total
1. Annual benefits	$100,369,000	$58,071,000	$40,000	$158,480,000
2. Single-purpose alternative	(642,839,000)	(269,794,000)		
(1) Construction cost	22,665,503	9,512,517		
(2) Interest during construction	1,276,391	510,648		
(3) Operation, maintenance and replacement	4,485,000	3,655,000		
(a) Total	28,426,894	13,678,165	More	
3. Justifiable investment	28,426,894	17,668,165	40,000	46,135,059
4. Less specific costs	(481,885,000)	(110,966,000)	0	
(1) Construction cost	16,991,000	3,912,000		
(2) Interest during construction	790,000	133,000		
(3) Operation, maintenance and replacement	6,471,000	2,658,000		
(a) Total	24,252,000	6,703,000	0	30,955,000
5. Remaining alternative	4,174,894	10,965,165	40,000	15,180,059
6. Percent distribution	27.5	72.2	0.3	100.0
7. Total joint costs to be allocated	($44,140,525)	($115,888,942)	($481,533)	($160,511,000)
(1) Construction cost	1,556,326	4,086,064	16,978	5,659,368
(2) Interest during construction	103,950	272,916	1,134	378,000
(3) Operation, maintenance and replacement	293,975	771,818	3,207	1,069,000
(a) Total	1,954,251	5,130,798	21,319	7,106,368
8. Total annual costs (line 4 (a) plus 7 (a))	26,206,251	11,833,798	21,319	38,061,368
Benefit-cost ratio	3.83	4.91	1.88	4.16
9. Reservoir construction cost allocation:				
(1) Joint reservoir costs	$44,140,518	$115,888,947	$481,530	$160,510,995
(2) Specific reservoir costs		110,966,000		110,966,000
(a) Total	44,140,518	226,854,947	481,530	271,476,995
10. Recapitulation of reimbursable power costs:				
(1) Dam and reservoir		226,854,947		
(2) Interest during construction		11,512,448		
(a) Total power investment		238,367,395		
(b) Reimbursable with interest (92.5 percent)		220,489,840		
11. Non-interest-bearing power investment to irrigation (7.5 percent)	17,014,121	220,489,840		
12. Final allocation of reservoir costs	61,154,639	220,489,840	481,530	282,126,000
Total (rounded)	61,155,000	220,490,000	481,000	282,126,000
Irrigation system	(481,885,000)			

STUDY NO. 1–C.—*Priority of use method*

	Irrigation	Power	Navigation	Total
Remaining alternative [1]	$152,860,000	$401,478,000	$1,465,000	
Allocation of joint reservoir costs	72,925,000	87,586,000		$160,511,000
Specific reservoir costs		110,966,000		110,966,000
Total allocation of reservoir construction costs	72,925,000	198,552,000		271,477,000
Recapitulation of reimbursable power costs:				
Dam and reservoir		198,552,000		
Interest during construction		11,099,000		
Total power investment		209,651,000		
Reimbursable with interest (92½ percent)		193,927,000		
Non-interest-bearing power investment to irrigation (7½ percent)	14,891,000			
Final allocation	87,816,000	193,927,000		281,743,000
Irrigation system	(481,885,000)			

[1] From line 5, alternative justifiable expenditure study, capitalized 50 years at 2½ percent.

COLUMBIA BASIN PROJECT—Continued

Summary of results of applying various methods of cost allocation to the Columbia Basin project, Washington

	Irrigation	Power	Navigation	Total
1. Separable costs-remaining benefits:				
(1) Allocation of joint reservoir costs	$50,775,000	$60,617,000	$447,000	$111,839,000
(2) Add specific reservoir costs	1,683,000	157,955,000		159,638,000
(a) Subtotal, reservoir allocation	52,458,000	218,572,000	447,000	271,477,000
(3) Division of power allocation	16,393,000	−16,393,000		
(4) Interest during construction		10,606,000		
(a) Final reservoir allocation	68,851,000	212,785,000	447,000	282,083,000
Irrigation system	481,885,000			
Total irrigation allocation	550,736,000			
2. Alternative justifiable expenditure:				
(1) Allocation of joint reservoir costs	44,140,000	115,889,000	482,000	160,511,000
(2) Add specific reservoir costs		110,966,000		110,966,000
(a) Subtstal, reservoir allocation	44,140,000	226,855,000	482,000	271,477,000
(3) Division of power allocation	17,014,000	−17,014,000		
(4) Interest during construction		10,649,000		
(a) Final reservoir allocation	61,154,000	220,490,000	482,000	282,126,000
Irrigation system	481,885,000			
Total irrigation allocation	543,039,000			
3. Priority of use:				
(1) Allocation of joint reservoir costs	72,925,000	87,586,000		160,511,000
(2) Allocation of specific reservoir costs		110,966,000		110,966,000
(a) Subtotal, reservoir allocation	72,925,000	198,552,000		271,477,000
(3) Division of power allocation	14,891,000	−14,891,000		
(4) Interest during construction		10,266,000		
(a) Final reservoir allocation	87,816,000	193,927,000		281,743,000
Irrigation system	481,885,000			
Total irrigation allocation	569,701,000			
4. Average of alternative justifiable expenditure and priority of use:				
(1) Allocation of joint reservoir costs	58,530,000	101,738,000	241,000	160,509,000
(2) Allocation of specific reservoir costs		110,966,000		110,966,000
(a) Subtotal, reservoir allocation	58,530,000	212,704,000	241,000	271,475,000
(3) Division of power allocation	15,952,000	−15,952,000		
(4) Interest during construction		10,458,000		
(a) Final reservoir allocation	74,482,000	207,210,000	241,000	281,933,000
Irrigation system	481,885,000			
Total irrigation allocation	556,367,000			

CENTRAL VALLEY PROJECT

STUDY NO. 1.—*Summary of results of applying various methods of cost allocation to the Central Valley project, California*

[In thousands of dollars]

Item	Irrigation	Municipal and industrial water service	Commercial power	Flood control	Navigation	Fish and wildlife		Recreation	Total
						Reimbursable	Nonreimbursable		
1. Separable costs-remaining benefits:									
Central Valley project without Trinity addition: [1]									
(1) Allocation of joint costs	103,147	9,949	52,803	35,684	12,940	129	13		214,665
(2) Add: Specific costs [2]	155,587	7,470	83,479			1,104	10,576		258,216
Total	258,734	17,419	136,282	35,684	12,940	1,233	10,589		472,881
(3) Add: Distribution systems	54,458	440							54,898
Total, all costs	313,192	17,859	136,282	35,684	12,940	1,233	10,589		527,779
Trinity addition: [1]									
(1) Allocation of joint costs	56,149		88,958			405	198		145,710
(2) Specific costs [2]	69,722		66,797			1,099	841	215	138,674
Total, all costs	125,871		155,755			1,504	1,039	215	284,384
Central Valley project with Trinity addition:									
(1) Allocation of joint costs	159,296	9,949	141,761	35,684	12,940	534	211		360,375
(2) Add: Specific costs [2]	225,309	7,470	150,276			2,203	11,417	215	396,890
Total	384,605	17,419	292,037	35,684	12,940	2,737	11,628	215	757,265
(3) Add: Distribution systems	54,458	440							54,898
Total, all costs	439,063	17,859	292,037	35,684	12,940	2,737	11,628	215	812,163
2. Alternative justifiable expenditure:									
Central Valley project without Trinity Addition: [1]									
(1) Allocation of joint costs	122,184	9,816	39,675	30,880	11,523	533	54		214,665
(2) Add: Specific costs [2]	155,587	7,470	83,479			1,104	10,576		258,216
Total	277,771	17,286	123,154	30,880	11,523	1,637	10,630		472,881
(3) Add: Distribution systems	54,458	440							54,898
Total, all costs	332,229	17,726	123,154	30,880	11,523	1,637	10,630		527,779

Trinity addition: [1]									
(1) Allocation of joint costs	62,511		82,521			480	198		145,710
(2) Add: Specific costs [2]	69,722		66,797			1,099	841	215	138,674
Total, all costs	132,233		149,318			1,579	1,039	215	284,384
Central Valley project with Trinity addition: [1]									
(1) Allocation of joint costs	184,695	9,816	122,196	30,880	11,523	1,013	252		360,375
(2) Add: Specific costs [2]	225,309	7,470	150,276			2,203	11,417	215	396,890
Total	410,004	17,286	272,472	30,880	11,523	3,216	11,669	215	757,265
(3) Add: Distribution systems	54,458	440							54,898
Total, all costs	464,462	17,726	272,472	30,880	11,523	3,216	11,669	215	812,163
3. Priority of use:									
Central Valley project without Trinity addition: [1]									
(1) Allocation of joint costs	137,869			55,927	20,869	0	0		214,66
(2) Add: Specific costs [2]	155,587	7,470	83,479			1,104	10,576		258,216
Total	293,456	7,470	83,479	55,927	20,869	1,104	10,576		472,881
(3) Add: Distribution systems	54,458	440							54,898
Total, all costs	347,914	7,910	83,479	55,927	20,869	1,104	10,576		527,779
Trinity addition: [1]									
(1) Allocation of joint costs	89,580		55,250			682	198		145,710
(2) Add: Specific costs [2]	69,722		66,797			1,099	841	215	138,674
Total, all costs	159,302		122,047			1,781	1,039	215	284,384
Central Valley project with Trinity addition: [1]									
(1) Allocation of joint costs	227,449		55,250	55,927	20,869	682	198		360,375
(2) Add: Specific costs [2]	225,309	7,470	150,276			2,203	11,417	215	396,890
Total	452,758	7,470	205,526	55,927	20,869	2,885	11,615	215	757,265
(3) Add: Distribution systems	54,458	440							54,898
Total, all costs	507,216	7,910	205,526	55,927	20,869	2,885	11,615	215	812,163
4. Average of alternative justifiable expenditure and priority of use allocations:									
Central Valley project without Trinity addition: [1]									
(1) Allocation of joint costs	130,027	4,908	19,837	43,404	16,196	211	82		214,665
(2) Add: Specific costs [2]	155,587	7,470	83,479			1,104	10,576		258,216
Total	285,614	12,378	103,316	43,404	16,196	1,315	10,658		472,881
(3) Add: Distribution systems	54,458	440							54,898
Total, all costs	340,072	12,818	103,316	43,404	16,196	1,315	10,658		527,779

See footnotes at end of table, p. 116.

CENTRAL VALLEY PROJECT—Continued

STUDY NO. 1.—*Summary of results of applying various methods of cost allocation to the Central Valley project, California*—Continued

[In thousands of dollars]

Item	Irrigation	Municipal and industrial water service	Commercial power	Flood control	Navigation	Fish and wildlife		Recreation	Total
						Reimbursable	Nonreimbursable		
6. Average of alternative justifiable expenditure and priority of use allocations—Continued									
Trinity addition: [1]									
(1) Allocation of joint costs	76,045		68,886			581	198		145,710
(2) Add: Specific costs [2]	69,722		66,797			1,099	841	215	138,674
Total, all costs	145,767		135,683			1,680	1,039	215	284,384
Central Valley with Trinity addition: [1]									
(1) Allocation of joint cost	206,072	4,908	88,723	43,404	16,196	792	280		360,375
(2) Add: Specific costs [2]	225,309	7,470	150,276			2,203	11,417	215	396,890
Total	431,381	12,378	238,999	43,404	16,196	2,995	11,697	215	757,265
(3) Add: Distribution system	54,458	440							54,898
Total, all costs	485,839	12,818	238,999	43,404	16,196	2,995	11,697	215	812,163

[1] The Trinity addition caption includes the Trinity River division and Sacramento canals unit.

[2] Includes single, dual, and joint purpose costs; the latter only when the unit of product provides a common denominator for functional distribution.

STUDY NO. 1–A.—*Allocation of construction costs of the Central Valley project, California, (less the Trinity River division and Sacramento Canals unit) by the separable costs-remaining benefits method*

[In thousands of dollars]

Item	Irrigation	Municipal and industrial water service	Commercial power	Flood control	Navigation	Fish and wildlife		Total
						Reimbursable	Nonreimbursable	
Present worth values: [1]								
Benefits	2,894,483	53,348	457,366	100,742	37,591	6,552		3,550,082
Alternate cost	642,219	53,348	457,366	290,571	42,014	6,552	10,466	1,502,536
Construction cost	(557,530)	(53,348)	(359,233)	(279,240)	(26,900)	(6,552)	(4,745)	(1,404,403)
Operation, management, and replacement	(84,689)			(11,331)	(15,114)		(5,721)	
Taxes foregone at $8.50 a year per kilowatt			(98,133)					(98,133)
Benefits limited by alternative cost	642,219	53,348	457,366	100,742	37,591	6,552	10,466	1,308,284
Separable cost	276,406	12,879	287,975	3,487	0	2,556	10,466	593,769
Remaining benefits	365,813	40,469	169,391	97,255	37,591	3,996	0	714,515
Allocated joint cost [2]	199,185	22,036	92,233	52,955	20,468	2,176	0	389,053
Allocation of all costs	475,591	34,915	380,208	56,442	20,468	4,732	10,466	982,822
Allocation deductions	66,344	7,363	164,647			2,587		240,941
Operation, management and replacement	(66,344)	(7,363)	(66,514)			(2,587)		(142,808)
Taxes foregone			(98,133)					(98,133)
Allocation of construction cost at present prices	409,247	27,552	215,561	56,442	20,468	2,145	10,466	741,881
Adjusted to total estimated cost:								
Allocation of project inventory without adjustment of fish and wildlife [3]	258,734	17,419	136,282	35,684	12,940	1,356	10,466	472,881
Adjustment of fish and wildlife allocation [4]						1,233	10,589	
Allocation of nonreimbursable investment				35,684	12,940		10,589	59,213
Allocation of repayable investment	258,734	17,419	136,282			1,233		413,668
Allocation of project investment	258,734	17,419	136,282	35,684	12,940	1,233	10,589	[5] 472,881

[1] All construction and operations, management and replacement cost estimates are placed on a common price level approximating that of April 1956. Operation, management and replacement expenses for a 50-year period are converted to present worth at 2½ percent interest.

[2] The joint cost assigned each purpose is 0.5444994 of the remaining benefit ($389,053,000/$714,515,000).

[3] The allocation on 1956 costs is adjusted to total estimated cost by adjusting the allocation to each purpose (except specific nonreimbursable fish and wildlife) proportionately. The factor is 0.632220.

[4] As 9.1 percent (7,000 acre-feet) of the fish and wildlife water delivered is free, adjustment is made at this point to transfer a corresponding percentage of the reimbursable fish and wildlife allocation to the nonreimbursable column.

[5] Does not include $54,898,000 for water service distribution systems, or $67,000 for a fish hatchery pipeline at Friant for which the Federal Government was reimbursed by the State of California.

CENTRAL VALLEY PROJECT—Continued

STUDY NO. 1-B.—*Allocation of construction costs of the Trinity River division and Sacramento canals unit of the Central Valley project, California, by the separable costs-remaining benefits method*

[In thousands of dollars]

Item	Irrigation	Commercial Power	Fish and wildlife		Recreation	Total
			Reimbursable	Nonreimbursable		
PRESENT WORTH VALUES [1]						
Benefits	656,496	289,519	2,102		215	948,332
Alternate cost	183,376	289,519	2,102	1,039	215	476,251
Construction	(154,416)	(216,685)	(1,960)	(841)	(215)	(403,417)
Operation, management, and replacement	(28,960)		(142)	(198)		
Taxes foregone		(72,834)				(72,834)
Benefits limited by alternative cost	183,376	289,519	2,102	1,039	215	476,251
Separable cost	92,709	212,170	1,351	1,039	215	307,484
Remaining benefits	90,667	77,349	751	0	0	168,767
Allocated joint cost [2]	57,236	48,828	474	0	0	106,538
Allocation of all costs	149,945	260,998	1,825	1,039	215	414,022
Allocation deductions	24,074	105,243	321			129,638
Operation, management, and replacement	(24,074)	(32,409)	(321)			(56,804)
Taxes foregone		(72,834)				(72,834)
Allocation of construction costs	125,871	155,755	1,504	1,039	215	284,384

[1] All construction and operation, management and replacement costs estimates are placed on a common price level (approximately April 1956) and the operation, management, and replacement assumed for a 50-year period is converted to present worth using a 2½ percent interest rate.

[2] The assignment of joint costs to each project purpose is 0.6312727 of the remaining benefits ($106,538,000/$168,767,000).

STUDY NO. 2-A.—*Allocation of construction costs of the Central Valley project, California (less Trinity River division and Sacramento canals unit) by the alternative justifiable expenditure method*

[In thousands of dollars]

	Irrigation	Municipal and industrial water service	Commercial power	Flood control	Navigation	Fish and wildlife		Total
						Reimbursable	Nonreimbursable [2]	
Present worth values: [1]								
Benefits	2,894,483	53,348	457,366	100,742	37,591	6,552		3,550,082
Alternate cost	642,219	53,348	457,366	290,571	42,014	6,552	10,466	1,502,536
Construction cost	(557,530)	(53,348)	(359,233)	(279,240)	(26,900)	(6,552)	(4,745)	(1,404,403)
Operation, maintenance, and replacement	(84,689)			(11,331)	(15,114)		(5,721)	
Taxes foregone at $8.50 per year per kilowatt			(98,133)					(98,133)
Benefits limited by alternative cost	642,219	53,348	457,366	100,742	37,591	6,552	10,466	1,308,284
Single-purpose costs [2]	234,199	20,773	311,799			4,329	10,466	581,566
Construction cost	(173,051)	(13,714)	(156,060)			(1,912)	(4,745)	(349,482)
Operation, maintenance, and replacement	(61,148)	(7,059)	(57,606)			(2,417)	(5,721)	(133,951)
Taxes foregone			(98,133)					(98,133)
Remaining justifiable expenditure	408,020	32,575	145,567	100,742	37,591	2,223		726,718
Allocation of joint cost [3]	225,287	17,986	80,375	55,625	20,756	1,227		401,256
Allocation of all costs	459,486	38,759	392,174	55,625	20,756	5,556	10,466	982,822
Deductions	239,395	21,077	320,707			4,499	10,466	596,144
Single purpose construction cost	(173,051)	(13,714)	(156,060)			(1,912)	[4] (10,466)	(355,203)
Operation, maintenance, and replacement	(66,344)	(7,363)	(66,514)			(2,587)		(142,808)
Taxes foregone			(98,133)					(98,133)
Allocation, joint construction cost at present prices	220,091	17,682	71,467	55,625	20,756	1,057		(386,678)
Adjustment to total estimated cost:								
Allocation, joint construction cost [5]	122,184	9,816	39,675	30,880	11,523	587		214,665
Single purpose construction cost	155,587	7,470	83,479			1,214	10,466	258,216
Allocation of project investment before Fish and Wildlife adjustment	277,771	17,286	123,154	30,880	11,523	1,801	10,466	472,881
Adjustment of fish and wildlife allocation [6]						1,637	10,630	
Allocation of nonreimbursable investment				30,880	11,523		10,630	53,033
Allocation of repayable investment	277,771	17,286	123,154			1,637		419,848
Allocation of project investment	277,771	17,286	123,154	30,880	11,523	1,637	10,630	[7] 472,881

[1] All construction and operation, maintenance, and replacement cost estimates are placed on a common price level approximating that of April 1956. Operation, maintenance, and replacement expenses for a 50-year period are converted to present worth at 2½ percent interest.

[2] Includes single-purpose, dual, and joint costs; the latter only where the unit of product provides a common denominator for proportionate use assignment.

[3] The joint cost assigned each purpose is 0.552148 of the remaining benefit ($401,256,000/726,718,000=0.552148).

[4] Includes capital costs and capitalized operation, maintenance, and replacement costs associated therewith.

[5] The allocation of 1956 joint costs is adjusted to estimated actual costs by adjusting the allocation to each purpose proportionately. The factor is 0.5551518.

[6] As 9.1 percent (7,000 acre-feet) of fish and wildlife water is delivered free, adjustment is made at this point to transfer a corresponding percentage of the reimbursable fish and wildlife allocation to the nonreimbursable column.

[7] Does not include $54,898,000 for water distribution systems, or $67,000 for a fish hatchery pipeline at Friant for which the Federal Government was reimbursed by the State of California.

CENTRAL VALLEY PROJECT—Continued

STUDY NO. 2–B.—*Allocation of construction costs of the Trinity River division and Sacramento canals unit of the Central Valley project, California by the alternative justifiable expenditure method*

[In thousands of dollars]

Item	Irrigation	Commercial power	Fish and wildlife		Recreation	Total
			Reimbursable	Nonreimbursable		
Present worth values: [1]						
Benefits	656,496	289,519	2,102		215	948,332
Alternate costs	183,376	289,519	2,102	1,039	215	476,251
Construction	(154,416)	(216,685)	(1,960)	(841)	(215)	(403,417)
Operation, maintenance, and replacement	(28,960)		(142)	(198)		
Taxes foregone at $8.50 per kilowatt per year		(72,834)				(72,834)
Benefits limited by alternative cost	183,376	289,519	2,102	1,039	215	476,251
Single purpose costs [2]	89,431	168,194	1,402	1,039	215	260,281
Construction cost	(69,722)	(66,797)	(1,099)	(841)	(215)	(138,674)
Operation, maintenance, and replacement	(19,709)	(28,563)	(303)	(198)		(48,773)
Taxes foregone at $8.50 per kilowatt per year		(72,834)				(72,834)
Remaining justifiable expenditure	93,945	121,325	700			215,970
Allocation of joint cost [3]	66,876	86,367	498			153,741
Allocation of all costs	156,307	254,561	1,900	1,039	215	414,022
Deductions	24,074	105,243	321			129,638
Operation, maintenance, and replacement	(24,074)	(32,409)	(321)			(56,804)
Taxes foregone		(72,834)				(72,834)
Allocation of project investment	132,233	149,318	1,579	1,039	215	284,384

[1] All contribution and operation, maintenance, and replacement cost estimates are placed on a common price level (approximately April 1956) and the operation, maintenance, and replacement assumed for a 50-year period is converted to present worth using a 2½ percent interest rate.

[2] Includes single-purpose, dual, and joint costs; the latter only where the unit of product provides a common denominator for proportionate use assignment.

[3] The joint cost assigned each function is 0.71186276 of the remaining benefit ($153,741,000/$215,970,000).

STUDY NO. 3–A.—*Allocation of construction costs of the Central Valley project, California (less the Trinity River division and Sacramento canals unit) by the priority of use method*

[In thousands of dollars]

Item	Irrigation	Municipal and industrial water service	Commercial power	Flood control	Navigation	Fish and wildlife		Total
						Reimbursable	Nonreimbursable	
Present worth values: [1]								
Benefits	2,894,483	53,348	457,366	100,742	37,591	6,552		3,550,082
Alternate cost	642,219	53,348	457,366	290,571	42,014	6,552	10,466	1,502,536
Construction cost	(557,530)	(53,348)	(359,233)	(279,240)	(26,900)	(6,552)	(4,745)	(1,404,403)
Operation, maintenance, and replacement	(84,689)			(11,331)	(15,114)		(5,721)	
Taxes foregone			(98,133)					(98,133)
Justifiable expenditure	642,219	53,348	457,366	100,742	37,591	6,552	10,466	1,308,284
Single-purpose costs	234,199	20,773	311,799			4,329	10,466	581,566
Construction	(173,051)	(13,714)	(156,060)			(1,912)	(4,745)	(349,482)
Operation, maintenance, and replacement	(61,148)	(7,059)	(57,606)			(2,417)	(5,721)	(133,951)
Taxes foregone			(98,133)					(98,133)
Remaining justifiable expenditure	408,020	32,575	145,567	100,742	37,591	2,223		726,718
Allocation of joint cost [2]	262,923			100,742	37,591			401,256
Allocation of all costs	497,122	20,773	311,799	100,742	37,591	4,329	[3] 10,466	982,822
Deductions	248,777	21,077	320,707			4,499	10,466	596,144
Single-purpose construction cost	(173,051)	(13,714)	(156,060)			(1,912)	[3] (10,466)	(355,203)
Operation, maintenance, and replacement	(75,726)	(7,059)	(57,606)			(2,417)		(142,808)
Taxes foregone			(98,133)					(98,133)
Allocation, joint construction cost at present prices	248,345	0	0	100,742	37,591	0		386,678
Adjusted to total estimated cost:								
Allocation, joint construction cost [4]	137,869	0	0	55,927	20,869	0		214,665
Single-purpose construction cost	155,587	7,470	83,479			1,214	[3] 10,466	258,216
Allocation of project investment without fish and wildlife adjustment	293,456	7,470	83,479	55,927	20,869	1,214	10,466	472,881
Adjustment of fish and wildlife allocation [5]						1,104	10,576	
Allocation of nonreimbursable investment				55,927	20,869		10,576	87,372
Allocation of repayable investment	293,456	7,470	83,479			1,014		385,509
Allocation of project investment	293,456	7,470	83,479	55,927	20,869	1,104	10,576	[6] 472,881

[1] All construction and operation, maintenance, and replacement cost estimates are placed on a common price level approximating that of April 1956. Operation, maintenance, and replacement expenses for a 50-year period are converted to present worth at 2½ percent interest.

[2] The project purposes listed in order of priority are: flood control, navigation, irrigation, fish and wildlife; reimbursable, fish and wildlife; nonreimbursable, municipal and industrial water service, and commercial power. Joint costs are assigned to flood control equal to the remaining justifiable expenditure, then to navigation, irrigation, and successively lower priority purposes on the same basis until all joint costs are assigned.

[3] Includes capitalized operation, maintenance, and replacement.

[4] The joint construction cost allocation based on present prices is adjusted to total estimated cost by a proportionate reduction (0.555152) of the allocation to each purpose.

[5] Since 9.1 percent (7,000 acre-feet) of wildlife water is delivered free an adjustment is made to transfer a corresponding percentage of the reimbursable fish and wildlife cost assignment to the nonreimbursable column.

[6] Does not include $54,898,000 for water service distribution systems, nor $67,000 for the Friant fish hatchery pipeline financed by the Federal Government but reimbursed by the State of California.

CENTRAL VALLEY PROJECT—Continued

STUDY NO. 3–B.—*Allocation of construction costs of the Trinity River division and Sacramento canals unit of the Central Valley project, California, by the priority of use method*

[In thousands of dollars]

Item	Irrigation	Commercial power	Fish and wildlife		Recreation	Total
			Reimbursable	Nonreimbursable		
Present worth values:[1]						
Benefits	656,496	289,519	2,102		215	948,332
Alternate cost	183,376	289,519	2,102	1,039	215	476,251
Construction cost	(154,416)	(216,685)	(1,960)	(841)	(215)	(403,417)
Operation, maintenance, and replacement	(28,960)		(142)	(198)		
Taxes foregone		(72,834)				(72,834)
Justifiable expenditure	183,376	289,519	2,102	1,039	215	476,251
Single-purpose costs [2]	89,431	168,194	1,402	1,039	215	260,281
Construction	(69,722)	(66,797)	(1,099)	(841)	(215)	(138,674)
Operation, maintenance, and replacement	(19,709)	(28,563)	(303)	(198)		(48,773)
Taxes foregone		(72,834)				(72,834)
Remaining justifiable expenditure	93,945	121,325	700			215,970
Allocation of joint cost [3]	93,945	59,096	700			153,741
Allocation of all costs	183,376	227,230	2,102	1,039	215	414,022
Deductions	24,074	105,243	321			129,638
Operation, maintenance, and replacement	(24,074)	(32,409)	(321)			(56,804)
Taxes foregone		(72,834)				(72,834)
Allocation of project investment	159,302	122,047	1,781	1,039	215	284,384

[1] All construction and operation, maintenance, and replacement cost estimates are placed on a common price level (approximately April 1956) and the operation, maintenance, and replacement assumed for a 50-year period is converted to present worth using a 2½ percent interest rate.

[2] Includes single purpose, dual, and joint costs; the latter only where the unit of product provides a common denominator for proportionate use assignment.

[3] The project purposes listed in order of priority are: Irrigation, fish and wildlife; reimbursable, fish and wildlife; nonreimbursable, commercial power, and recreation. Joint costs are assigned to irrigation equal to the remaining justifiable expenditure, then to successively lower priority purposes on the same basis until all joint costs are assigned.

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